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## ABSTRACT

The 13-year study reported in this monograph attempted to accumulate a mass of longitudinal data on every aspect of linguistic behavior in 211 students representing a cross-section of American urban children. Presented as the major objectives of the study, which followed the subjects from kindergarten through grade 12, are 11 hypotheses to be tested dealing with whether the growth in children's language follows a predictable sequence, whether definite stages of language development can be identified, and whether the velocity and relative growth in language ability can be ascertained and precisely predicted. Also reported are the results of research to develop fundamental methods of analysis to aid the scientific study of children's language. The data presented in extensive tables and charts were obtained from annual oral interviews and their transcripts, written compositions, reading tests, I.Q. tests, listening tests, tests in the use of subordinating connectives, teachers' ratings, lists of books read, and miscellaneous other sources. Results are reported on the investigations into basic linguistic measures (e.g., average number of words per "communication unit" and "maze"), weighted indexes of elaboration, transformational analysis, verbs, and dependent clauses. (LH)

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STAGES, VELOCITY, AND PREDICTION OF LANGUAGE DEVELOPMENT  
KINDERGARTEN THROUGH GRADE TWELVE

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Berkeley, California

March 1970

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## PART I. INTRODUCTION

### Background of the Longitudinal Study

The research reported in this monograph is concerned specifically with the stages, velocity, and relative growth of children's language. The study, based on previous research conducted by the investigator, makes use of large quantities of untapped data obtained during an intensive, thirteen-year longitudinal study of children's language.<sup>1</sup>

The longitudinal study began in 1953, using eleven kindergarten classes carefully selected as a representative cross-section of children then entering the public school system of Oakland, California. In the ensuing years, each of the initial 338 subjects remaining within the geographic limits of the project was studied on an annual basis.<sup>2</sup> During the last part of each school year (February through May), every subject was recorded on tape or audograph, and in addition to these standard oral interviews, a wide range of data was gathered on other facets of his linguistic behavior. This phase of the research--the accumulation of data and the publication of initial findings--continued until 1965-66 by which time all subjects remaining in the study (N = 211 at grade twelve) had either graduated from high school or were no longer receiving academic instruction.

### Purpose of the Investigation

From the outset, the basic purpose of the research has been to accumulate a mass of longitudinal data on every aspect of linguistic behavior, gathering the information in situations identical for each subject and using a cross-section of children from a typical American city so that the findings could be generalized to any large urban population in twentieth-century America. The major questions forming the purposes and dimensions of the current three-year investigation were the following:

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<sup>1</sup> See Walter Loban, The Language of Elementary School Children (Champaign, Illinois: National Council of Teachers of English, 1963), Problems in Oral English (Champaign, Illinois: National Council of Teachers of English, 1966), Language Ability: Grades Seven, Eight, and Nine (Washington, D.C.: U.S. Government Printing Office, 1966), and Language Ability: Grades Ten, Eleven, and Twelve (final report to the Office of Education, 1967).

<sup>2</sup> For practical purposes the geographic limits were taken to be a distance of approximately 100 miles from the investigator's research headquarters at the University of California in Berkeley. Within this radius, a subject was considered to be still available for continued study.

- . . . Does the growth in children's language follow a predictable sequence?
- . . . Can definite stages of language development be identified?
- . . . Can the velocity and relative growth in language ability be ascertained and predicted precisely?

In addition, the present phase of the investigation was also concerned with developing fundamental methods of analysis to aid the scientific study of children's language and to locate significant language features worthy of further study.

#### Design of the Research, A Brief Overview

One crucial aspect of any research is to ensure that the sample used in the study is a true cross-section of the larger population. Care was taken to select a proportional representation of the socio-economic backgrounds typical of the city of Oakland. The range of family status moved from those in definitely poor economic circumstances in the industrial areas by the Bay, through the middle-class areas of the city, to those who lived in the more favored socio-economic circumstances of the hill-top districts. It should be noted, however, that stratification was not tied to a single variable. Precautions were taken to avoid any unique or unusual factors of selection, and a stringent effort was made to ensure representativeness on the bases of sex, ethnic background, and spread of intellectual ability.<sup>1</sup> The four characteristics decided upon--sex, ethnic background, socio-economic status, and spread of intellectual ability--were chosen as the bases of selection inasmuch as previous studies of children's language identified one or more of these four variables as having a primary influence on language proficiency.

A second crucial aspect--one of particular importance in a longitudinal study--is the necessity of keeping the attrition rate within reasonable bounds. At the outset it was hoped that a sample size of 338 would enable the investigator to retain approximately 50 subjects on whom there would be complete data from kindergarten through grade twelve. However, a combination of persistence and good fortune made it possible to retain a total of 211 subjects throughout the entire thirteen-year period of the study.

In respect to the overall design of the research, one aspect necessitating particular attention is the use of special subgroups

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<sup>1</sup> The initial method of determining spread of intellectual ability was a Kindergarten Vocabulary Test of 100 items. In grade two the first standard intelligence testing was carried out by the Oakland Public Schools. The spread of intellectual ability has been discussed in detail in previous monographs by the investigator.

selected from the total sample. These consist of a group high in language ability, a group low in language ability, and a Random group of subjects used in place of the total group. The use of the Random group in lieu of the total group results from the prohibitive expenditure of time and money that would have been required if particular complex types of analysis had been carried out for all 211 subjects on whom comprehensive data have been obtained. Thus, for the purpose of this monograph, the statistical data will be limited to the High and Low groups (each with an N of 35), selected on the basis of a thirteen-year cumulative average of teachers' ratings,<sup>1</sup> and the Random group (N = 35), selected by a table of random numbers.

Lastly, the reader should note one of the fundamental objectives of this research: to develop new methods of analysis making it possible to study the use of language in both its semantic and structural aspects. As the findings of the investigation are sifted and subjected to further forms of analysis, older methods may be refined or improved upon, or in an extreme case a completely new method of analysis may seem more appropriate to a given set of linguistic data. Thus, as in any study intended to chart new ground over an extended period of time, the research is based on a developmental design with hypotheses and methods subject to modification during the course of the research.

#### Data Collected During the Longitudinal Study

Throughout the longitudinal study an effort was made to obtain as comprehensive a record as possible for each subject, not only on his linguistic growth and behavior but also on other variables which might have influenced how he learned to speak, read, write, and listen to the English language. Thus, the present research draws on the following sources of data:

##### Annual Oral Interviews

In the spring of each year, every subject was interviewed individually with his responses recorded on either a tape recorder or a similar recording device (an audograph). In any given year the interviews were identical for all subjects although it should be noted that during the course of the research the format of the interviews was altered periodically to take into account the advancing age of the subjects. Typical of the early years were questions about games, playmates, and television; in later years the emphasis shifted to such items as parties attended, plans for the future, and the magazines, comic books, or books read during that year.

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<sup>1</sup> Annual ratings (obtained on each subject) in which the teacher has rated the subject's ability in language in accordance with a carefully designed scale. See page 5 for a description of this scale.



In addition to the types of questions cited above, a series of pictures was used to elicit response. Again, the same series of pictures was shown to every subject in any given year although these, too, were altered periodically to take into account the growing maturity of the subjects.

#### Typed Transcripts of the Oral Interviews

During the overall longitudinal study, the most expensive and time-consuming procedure was the typing and analysis of the subjects' oral interviews. There was an obvious need for precision since these typed transcripts undoubtedly constitute the most valuable source of data collected during the thirteen-year period, and as a result many thousands of hours were devoted to this phase of the study by a group of highly trained typists who worked to transcribe the interviews accurately according to a detailed set of instructions. Thus, the present research draws upon approximately 3250 typed transcripts containing roughly 3,800,000 words of spoken language.

#### Written Compositions

Beginning in grade three, samples of the subjects' written language were secured on an annual basis (one composition per year). The exception was in grades ten, eleven, and twelve when it was possible to secure two or more compositions per year for each subject. Therefore, in addition to the data on oral language, the present research draws on a longitudinal record of writing ability from grade three through grade twelve.

#### Reading Tests

The data on reading ability consists of test scores on either the Stanford or California test of reading achievement--generally with two or more scores for each subject. A reading test was not administered to every subject in every year. However, the accumulation of data is clearly sufficient for a definitive statement about the subjects' reading ability.

#### I.Q. Tests

In grade two of the Oakland primary schools, the Kuhlman-Anderson Intelligence Test is administered to all pupils. In addition, the majority of students are tested again in grades four, five, or six using this same form of the Kuhlman-Anderson Test.<sup>1</sup> In cases where a discrepancy appears between a pupil's score and the teacher's observations of the pupil's intellectual performance in class, further testing is carried out either with another form of the same test or with the individual Stanford-Binet Scale. As part of the data-gathering process, all I.Q. scores were obtained for every subject in the study.

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<sup>1</sup> A relatively small percentage of students are tested still further in grades seven or eight.



### Listening Tests

In grades eight and nine and again in grades eleven and twelve, the STEP Test of Listening Ability was administered to the majority of subjects in the study.<sup>1</sup>

### Tests on the Use of Subordinating Connectives

Beginning in grade five and continuing through grade twelve, a syntax test of the ability to use subordinating connectives was administered to every subject remaining in the study. The test consisted of fifty sentence completions, the written response indicating whether or not the subject was able to use appropriately such words as therefore, however, and moreover.<sup>2</sup>

### Teachers' Ratings

In every year of the study each subject's teacher rated him on a specified series of language factors, with each factor scored on a five-point scale. Throughout the course of the research, the following factors were included:

- |                                                   |   |                                            |
|---------------------------------------------------|---|--------------------------------------------|
| 1. amount of language                             | } | Each of these was defined for the teacher. |
| 2. quality of vocabulary                          |   |                                            |
| 3. skill in communication                         |   |                                            |
| 4. organization, purpose, and control of language |   |                                            |
| 5. wealth of ideas                                |   |                                            |
| 6. quality of listening                           |   |                                            |

In addition, beginning in grade four, the teacher was also asked to rate the subject on the quality of his writing and on his skill and proficiency in reading. Inasmuch as a cumulative average of teachers' ratings was the basis by which the investigator selected certain subgroups for special study, the scale merits particular attention. A sample of the teacher's rating scale may be found in the appendix.

---

<sup>1</sup> In attempting to obtain scores of listening ability, two problems were encountered making it impossible to test every subject in every year the test was administered. In cases where a particular subject proved to be a disruptive influence, it was thought best to exclude him rather than to risk introducing a bias in the scores of those remaining in the group being tested. In addition, there was a certain problem of economics in that if some subjects were absent or unable to complete the listening test, the prohibitive cost of making a special trip to a particular school and administering the test individually eliminated the possibility of obtaining a listening score on those subjects.

<sup>2</sup> This phase of the research has enabled the investigator and his staff to design a refined multiple choice test of 150 items; a copy may be found in the appendix of this monograph.

### Book Lists

Beginning in grade four and continuing through grade twelve, each subject was asked to list the books he had read during the previous year. The assumption, of course, is that the lists are incomplete since even an adult of good intelligence would have difficulty in remembering every book he had read during the span of an entire year. Care was taken, however, to obtain as complete a record as possible; no subject was permitted to turn in a blank list. In those instances of a subject who was a poor reader or perhaps not able to write the titles of anything he had read, a staff member obtained the information orally and completed the book list. For those subjects whose reading ability was so poor that they had not read a single book during the previous year, information was obtained on the magazines or comic books they had read in order to have at least some basis for determining their individual reading habits.

### Other Data

Among the other types of data accumulated during the longitudinal study were statements about the television programs the subjects watched, personality profiles, language questionnaires, records of school attendance, grades, and general state of health.

### Hypotheses Being Tested

As previously indicated, the total group of subjects was selected on the bases of sex, ethnic background, socio-economic status, and spread of intellectual ability. Thus the reader should bear in mind that even though it may not be stated explicitly, whenever appropriate any given hypothesis will be tested in terms of these four characteristics as well as in terms of the particular characteristic mentioned. Among the hypotheses being tested in the current three-year phase of the investigation are the following:

1. By using a specified set of data for subjects in grades one, two, and three, it will be possible to construct a model by which one may predict precisely the language ability of those same subjects in grades ten, eleven, and twelve.
2. Predictable stages of growth on each feature of language will emerge and can be identified for each group of subjects studied.
3. The stages and velocity of language growth will not show a steady, even pattern. Instead, there will be spurts of growth followed by plateaus, each of which can be identified.
4. In speech, reading, writing, and listening a strong positive correlation will be found. Only rarely will a subject show proficiency in one language art and a lack of proficiency in a second language art. Such subjects merit special study.

5. It will be possible to construct a weighted index of elaborated usage, an index which will correlate highly with other measures of language competence.

6. Subjects from above-average socio-economic status will develop language power earlier and to a greater competency than subjects from below-average socio-economic status.

7. Nonstandard English usage will be significantly less frequent for subjects of above-average socio-economic status than for those of below-average socio-economic status.

8. Subjects proficient in language will use most optional grammatical transformations in their sentence structures and will be more accurate in their obligatory grammatical transformations than those lacking in proficiency.

9. Subjects with high language proficiency will more frequently use phrases of all kinds in preference to subordinate clauses whenever a choice between the two is possible.

10. Subjects with high language proficiency will use relational words (e.g., subordinating connectors such as moreover, although, because, etc.) more accurately and at an earlier age than other subjects.

11. Subjects with high ability in language will use more adverbial clauses of cause, concession, and condition than subjects of low language ability.



## PART II. METHODS

### General Statement on Methodology

Wherever appropriate, standard procedures of quantitative and statistical description have been used. Methods derived from other research have been described and footnoted so one may easily locate the initial study. New methods have been discussed at length and, when helpful, illustrative examples have been provided. Most importantly, the methods used make it possible to present the status of the subjects' language at equally spaced periods of time, providing normative data for the total group of subjects as well as for the various subgroups used in the research.

To simplify this chapter, the presentation will describe only those methods of analysis actually utilized in the current three-year study. Each of these is discussed below.<sup>1</sup>

### Segmenting the Flow of Oral Language

A critical problem in the research was devising an objective method for segmenting the flow of oral language; after carefully trying various approaches that seemed feasible, the investigator settled upon the communication unit and the maze as the two methods of segmenting most suitable to the data.<sup>2</sup>

### The Communication Unit

The communication unit is the basic method of segmentation used in this research. By this method the typed transcripts of the subjects' oral interviews are processed for analysis. In addition, this method of segmentation--used also in the analysis of the subjects' written compositions--gives rise to one way of quantifying language development, the average number of words per communication unit.

The definition of the communication unit may be stated either semantically or structurally. In semantic terms it is what A. F. Watts described as "the natural linguistic unit," i.e., a group of

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<sup>1</sup> Other methods used during the course of the longitudinal study are described in detail in the monographs cited previously.

<sup>2</sup> The phonological unit as described in earlier monographs is seldom used in actual practice; basically it is the analysis of the subject's intonation pattern by which the analyst may double-check what has already been carried out, the segmentation of the transcript into communication units and mazes.



words which cannot be further divided without the loss of their essential meaning.<sup>1</sup> However, despite the apparent clarity of Watts' definition, the investigator found that it was also necessary to define the unit of segmentation in structural terms.<sup>2</sup> Thus, in 1953, the investigator decided upon the term communication unit and defined it as each independent clause with its modifiers.<sup>3</sup> Kellogg W. Hunt, studying children's writing, uses this same method of segmentation; in Hunt's research this unit has been termed a T-unit rather than a communication unit.<sup>4</sup>

As an illustration of what does or does not comprise a communication unit, a very simple example may be given. In terms of semantics if one were to say "I know a boy with red hair," the words would constitute a unit of communication. However, if the words "with red hair" had been omitted (chopped off, so to speak, by a different method of segmentation), the essential meaning of that particular unit of communication would have been changed. "I know a boy" does not mean the same thing as "I know a boy with red hair." Furthermore, the phrase "with red hair" left dangling by itself lacks completion. However, segmenting by meaning (semantics) offers too many opportunities for disagreement, and therefore the real process of segmentation devolves upon structure (each independent predication with all of its modifiers) double-checked whenever necessary by the intonation patterns of the human voice--pitch, stress, and pause. Thus, in all cases, the words comprising a communication unit will fall into one of the following three categories:

- (1) each independent grammatical predication

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<sup>1</sup> A. F. Watts, The Language and Mental Development of Children (Boston: D. C. Heath & Company, 1948), pp. 65-66.

<sup>2</sup> Actually, Watts' use of the term "essential meaning" would be difficult to define scientifically. As a consequence, the formal definition adopted for this research--that of an independent clause between two silences--becomes more defensible than the semantic (or essential meaning) definition.

<sup>3</sup> Some linguists have been critical of any use of "communication" or "meaning," urging a rigorous use of structure alone. The investigator, however, has seen no problem in using meaning as a double-check on the structural methodology actually being used; some mistakes have been located in this way, no dilemmas have arisen, and the research has retained a closer alliance with the ultimate purpose of language.

<sup>4</sup> Kellogg W. Hunt, Grammatical Structures Written at Three Grade Levels (Champaign, Illinois: National Council of Teachers of English, 1965).

- |                                                                                                                                                                                                                                                                                        |   |                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------|
| <p>(2) each answer to a question, provided that the answer lacks only the repetition of the question elements to satisfy the criterion of independent predication</p> <p>(3) each word such as "Yes" or "No" when given in answer to a question such as "Have you ever been sick?"</p> | } | <p>These two are necessary in oral but not in written language.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---------------------------------------------------------------------|

The following examples illustrate the method of tallying communication units. A slant line (/) marks the completion of each communication unit. Contractions of two words into one are counted as two words.

#### Examples of Communication Units

| <u>Transcript of subject's</u><br><u>actual language</u> | <u>Number of</u><br><u>communication</u><br><u>units</u> | <u>Number of words</u><br><u>in each</u><br><u>communication</u><br><u>unit</u> |
|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------|
| I'm going to get a boy 'cause                            |                                                          | 11                                                                              |
| he hit me./ I'm going to beat                            | 3                                                        |                                                                                 |
| him up and kick him in his nose/                         |                                                          | 13                                                                              |
| and I'm going to get the girl, too./                     |                                                          | 9                                                                               |

#### The Maze

Listening to the subjects' recorded interviews or reading the typed transcripts of their oral language, one cannot help but notice how frequently they become confused or tangled in words. In many respects the behavior in language resembles the physical behavior of someone trapped in a spatial maze, thrashing about in one direction or another, hesitating, making false starts, or needlessly repeating himself, until finally he either abandons his goal or finds the path. On occasion the path is stumbled upon accidentally; on other occasions there is enough presence of mind to pause and, presumably, to use the process of reasoning. In this research these linguistic tangles have been termed mazes.<sup>1</sup>

To define it more precisely, a maze is a series of words or initial parts of words which do not add up to a meaningful communication unit. It is an unattached fragment or a series of unattached fragments which do not constitute a communication unit and are not necessary to the communication unit.

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<sup>1</sup> Other researchers have studied this same phenomenon although, again, there has been no consistency in terminology. Hunt, for example (op. cit.), uses the term garbles rather than mazes.

In studying the examples of mazes, one discovers that when a maze is removed from a communication unit, the remaining material always constitutes a straightforward, clearly recognizable unit of communication. The procedure in this research has been to mark the maze in red brackets and enter a red number on the subject's transcript (as shown by the circled numbers in the examples below). Then, as a derivative of the initial analysis, it is possible to compute such data as average words per maze and maze words as a percentage of total words in order to have some measure of the subject's degree of linguistic uncertainty.

### Examples of Mazes

(Mazes are in brackets. The number of words in a maze is circled.)<sup>1</sup>

| <u>Transcript of subject's<br/>actual language</u>                                                                                                                                                | <u>Description<br/>of maze</u>                                                                                                                                                                | <u>Number of<br/>communication<br/>units</u> | <u>Number of<br/>words<br/>in each<br/>communication<br/>unit</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------|
| 1. [I'm going] . . .<br>I'm going to build<br>a flying saucer/<br>but I can't think<br>how yet./                                                                                                  | Short maze at the<br>beginning of a<br>communication unit<br>and integrally re-<br>lated to that com-<br>munication unit.                                                                     | 2                                            | ③-8<br>7                                                          |
| 2. When I was fixing<br>ready to go home,<br>my mother called<br>me up in the<br>house/ and [I, I,<br>have to] I have to<br>get my hair<br>combed./                                               | Short maze in the<br>middle of a com-<br>munication unit<br>and integrally<br>related to that<br>communication<br>unit.                                                                       | 2                                            | 16<br>1-④-7                                                       |
| 3. I saw a hunter pro-<br>gram last Sunday/<br>[and he, and snow<br>time he had to have<br>lot wah-h when<br>he not too<br>many dogs, he] . . .<br>and that's all I<br>think of that<br>picture./ | Long maze not imme-<br>diately related to<br>communication unit.<br>The child apparently<br>drops the idea he was<br>trying to express,<br>deeming it too com-<br>plicated for his<br>powers. | 2                                            | 7<br>⑮-9                                                          |

<sup>1</sup> In the actual transcript, the analyst always brackets and enters mazes in red pencil.



Statistically, the problem of dealing with mazes would seem relatively slight. After counting the words in a maze, one presumably has a number which may be compared to any other number. In actual practice, however, mazes continue to be one of the more confusing variables encountered in this research. The examples shown are generally termed "textbook examples," with each clearly defined to assist the reader's comprehension of what has been studied. In the research itself, however, the subjects' language sometimes becomes so intricate that it is difficult to tell if one is actually dealing with a maze or with a false start that is too clearly spoken to be judged a maze and yet not completed to the point that it would be considered a communication unit.<sup>1</sup>

In addition to the difficulties sometimes encountered in analysis, there is a further problem with mazes, pointing up the fact that one should not become totally dependent upon statistical measurement. Frequently a situation is encountered with two subjects having an equal proportion of mazes; and yet, when studying other measures of their language ability, it becomes obvious that the language skills of the subjects in question are inherently different. For example, a subject with a low maze count may be the type of person one would describe as thoughtful, reflective, and careful to speak precisely. On the other hand, the mere fact that the proportion of mazes is low is not proof that the subject actually has such characteristics. A low maze count is also associated with subjects classified as exceptionally poor in language ability, those who tend to speak in slow, short communication units, those who appear to have difficulty in verbalizing their ideas.

The opposite case is those who have a high proportion of mazes. Here again we may encounter two extremes of language ability. In one instance, a subject may be so eager to communicate that his speech tends to bubble forward too rapidly, producing a high incidence of mazes. In another case, a high maze count may be the result of a complete disorganization of thought--a lack of verbal control which produces a constant series of hesitations and false starts.

#### Elaboration Data Sheets

The statistical findings reported in this monograph have evolved mainly from what the investigator has termed the subjects' ability to elaborate the simple subject and predicate of each communication unit.

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<sup>1</sup> In the most complicated flows of language, a subject may have one or two uncompleted thoughts, an aside relating only tenuously to what is being said, and a further flow of language that culminates in a completed unit. Each of these in turn may have one or two maze words within it in addition to mazes at the beginning or end of the given segment.

For each subject in the High, Low, and Random groups, a total of thirty oral communication units per year was carefully selected for special forms of analysis. This selection was done for grades one through twelve, with each communication unit requiring a separate elaboration sheet for the analysis. In addition, the same type of analysis was done on the written language of the High, Low, and Random groups. Thus the enormity of the task indicates why it was not possible to do the analysis on all 211 subjects.<sup>1</sup> Not only average words per unit and data on mazes but also a wide range of other statistical data resulted from this analysis; these include the following.

#### Dependent Clauses: Method of Analysis

All speakers use many different strategies of elaboration, modifying not only through adjectives and adverbs but also by prepositional phrases, appositives, infinitive phrases, and infinitive clauses as well as dependent clauses. This special study examines dependent adjectival, adverbial, and noun clauses and then further divides adverbial clauses by type (such as condition, concession, or manner, etc.) and noun clauses by function (such as objective complement, direct object, or subject).

Subordination is typically a more mature and difficult form of syntactical structure than simple parallel statements connected by and or but. Furthermore, subordination makes possible a more coherent organization of related statements. Usually one thinks of dependent clauses when subordination is mentioned, but prepositional, participial, infinitive, and gerund phrases are also syntactical strategies for classifying thought relationships; through them, speakers communicate more complex propositions than are usually possible with simple independent clauses.

Some measure or index of subordination should reveal a difference between subjects proficient with language and those who are not. LaBrant was probably the first researcher to analyze subordination by a clearly defined series of rules.<sup>2</sup> She studied clauses as indications of skill in written language and developed a subordination index, dividing the

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<sup>1</sup> For oral language alone the research includes 37,800 separate elaboration data sheets, each containing a wealth of information subject to analysis.

<sup>2</sup> In LaBrant's research a subordinate clause which modifies an independent element of the communication unit is termed "first-order subordination. Subordination which modifies another subordinate element, which in turn modifies an independent element, is called "second-order subordination." Lou LaBrant, "A Study of Certain Language Developments of Children in Grades 4-12 Inclusive," Genetic Psychology Monographs, 14:5 (1933), pp. 387-491.

number of subordinate clauses by the total number of clauses in each subject's writing. Thus her subordination index is the percentage of dependent clauses among all the clauses written by an individual. Her index does not take into account any subordinating accomplished by infinitives, participles, and gerunds, whether these non-finite verbs be single or in phrases. In other words, her formula deals only with finite verbs and does not include the non-finite verbs (infinitives, participles, gerunds) or any other subordinating syntactical methods such as prepositional phrases, nominative absolutes, and appositives. Following LaBrant several studies added to the body of knowledge on subordination.<sup>1</sup>

Another index of clausal subordination has emerged from the recent research of Kellogg Hunt.<sup>2</sup> This, too, is based upon writing and restricted to finite verbs, but it is computed differently. Hunt divides the number of main clauses plus subordinate clauses by the number of main clauses.

| <u>LaBrant</u>                       | <u>Hunt</u>                          |
|--------------------------------------|--------------------------------------|
| <u>Number of subordinate clauses</u> | <u>Subordinate plus main clauses</u> |
| <u>Subordinate plus main clauses</u> | <u>Main clauses</u>                  |

Neither of these indexes deals with non-finite verbs or other methods of subordinating. Many scholars conceive of "subordination" as being only that of finite verbs, but this seems an unnecessary and narrowing concept of what subordinating actually is in human communication.

The ability to express natural or logical relations, however, does not depend solely upon finite verbs. Analysis of proficient speakers and writers reveals skillful use of prepositional phrases, infinitives, appositives, gerunds, and other strategies of structure to compress ideas into more mature, meaningful forms. Therefore, valuable pioneering though it was, the LaBrant index of subordination remains nevertheless an incomplete method of analyzing the structural complexity used by speakers and writers for density and compression of thought. Mature speakers and writers also replace dependent clauses with phrases of all kinds, as in these examples:

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<sup>1</sup> M. V. Bear, "Children's Growth in the Use of Written Language," Elementary English Review, 16 (1939), pp. 312-319.

F. K. Heider and G. M. Heider, "A Comparison of Sentence Structure of Deaf and Hearing Children," Psychological Monographs, 52:1 (1940), pp. 42-103.

<sup>2</sup> Hunt, op. cit.



### Less Mature

When Nina had fed the baby, she hurried after her father.

Literature is written so that it can clarify the real world.

The dog was in such a wild fury that he bit his master.

### More Mature

Having fed the baby, Nina hurried after her father.  
(Present perfect participle)

Literature is written to clarify the real world.  
(Infinitive phrase)

In his wild fury the dog bit his master.  
(Prepositional phrase)

The function of clauses may also reveal degrees of proficiency in language. Templin found that subjects age eight use five times as many subordinate clauses as subjects age three, but the difference varies according to type of clause:<sup>1</sup> the eight-year-old subjects use only four times as many adverbial clauses, compared with seven times as many noun clauses and twelve times as many adjectival clauses for the three-year-old subjects. Evidently the ability to use adjectival clauses is a later stage of development, and Templin's research shows a way toward establishing stages of development in language. Lawton's research also shows that socio-economic differences in the use of the adjectival clause are apparent at age twelve, but by age fifteen the working-class boys have caught up with the middle-class boys. Noun clauses used as objects are very common and are learned early in life, but noun clauses used as nominals (subjects, complements, and appositives) are much later developments; some subjects in Lawton's research do not develop them very well at all.<sup>2</sup>

Although clauses are often a less skillful syntactic strategy than verbal clusters in the writing of expert stylists, they do prove to be a sign of language proficiency in the speech and writing of the subjects in this longitudinal study. Included in any study of these amplifying clusters should be a count of the number of words in them; it is important to note that Hunt found the increase in length of communication units related to length of dependent clauses.<sup>3</sup>

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<sup>1</sup> Mildred C. Templin, Certain Language Skills in Children (Minneapolis, Minnesota: University of Minnesota Press, 1957).

<sup>2</sup> Denis Lawton, "Social Class Differences in Language Development: A Study of Some Samples of Written Work," Language and Speech, Vol. 6, Part 3 (1963), pp. 120-143.

<sup>3</sup> Hunt, op. cit.

In the early years of this longitudinal study, the investigator devised a weighted index of subordination that permitted a limited place to non-finite verbs. This index tallied all dependent clauses as follows:<sup>1</sup>

- 1 point for each dependent clause (first-order dependent clauses)
- 2 points for any dependent clause modifying or within another dependent clause (second-order dependent clauses)
- 2 points for any dependent clause containing a verbal construction such as an infinitive, gerund, or participle
- 3 points for any dependent clause within or modifying another dependent clause which, in turn, is within or modifies another dependent clause (third-order dependent clauses)

The reader should note that only if non-finite verbs or verb phrases occurred within a dependent clause was any notice taken of them. Non-finite verbal structures outside the dependent clause were ignored as were prepositional phrases, yet these are also powerful structural means of subordinating ideas. Even so, this limited weighted index of subordination revealed that subjects high in language proficiency scored higher than a random group of subjects or a group low in language proficiency, and all three groups showed an increase on the index as chronological age increased. However, this particular index, because of the limitations described, needs to be replaced by a better index.

In England, Lawton became convinced by studies of social class differences in language that maturity of expression is marked not only by an increase in the frequency of use of subordinate clauses but also in the complexity of their structuring. He states: "Several attempts have been made to measure this kind of complexity, and it was decided to employ Loban's weighted index of subordination, which has the merit of taking some non-finite constructions into account as well as finite. The results . . . show clearly that the ability to use subordinations of greater complexity than the first order dependence may be an index of age development but that class differences are once again more important. . . . It is felt, however, that although important differences have been indicated the measures used are linguistically very crude and are not a satisfactory method of carrying on investigations of any greater complexity. It would seem to be essential that future research in this field should be carried out using the methods of modern linguistics rather than trying to adapt the old-fashioned categories of conventional grammar."<sup>2</sup>

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<sup>1</sup> Walter Loban, The Language of Elementary School Children (Champaign, Illinois: National Council of Teachers of English, 1963).

<sup>2</sup> Lawton, op. cit., p. 138.

As a result of all these studies, two methods of studying subordination have been used in the present research. The first is a more comprehensive weighted index, including all strategies for elaborating a communication unit beyond the simple subject and predicate. The second method is the use of transformational grammar to assess subordination.<sup>1</sup> Each of these methods will be discussed in turn.

#### Elaboration of Communication Units: Method of Analysis

In this research the elaboration of language has been defined as the use of various strategies of syntax through which the individual communication unit is expanded beyond a simple subject and predicate. Thus the study of elaboration deals not only with modification through adjectives, adverbs, and dependent clauses but also with prepositional phrases, infinitives, appositives, participles, and other strategies of expansion.

The weight assigned to each elaborated structure was decided upon after an examination of the subjects' language.<sup>2</sup> The precise weights used in the research are shown below.

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<sup>1</sup> Analysis of subordination by transformational grammar may possibly accomplish the same goal with more methodological precision. Complex sentences are made up or generated from several source sentences. The matrix sentence, or independent clause, has embedded in it--grafted onto it--a number of other sentences; particularly important is the fact that some transformations will have deletions, becoming participles or gerunds, for instance; they, too, must be counted just as is everything that is nested into the main kernel sentence.

<sup>2</sup> As finally decided upon, the weights consist of a combination of mathematical frequency and a degree of intuitive reasoning. A tally was made to determine the actual incidence of each elaborated structure (appositive, modal, gerund, dependent clause, etc.); the most commonly used structures were accorded the least weight and the least commonly used structures the greatest weight. It was not, however, a simple rank-order procedure since it seemed obvious that the maximum weight for any type of structure should be kept within reasonable limits (generally, a ten-point framework). From the items listed, one can see that there are 22 structures which go through first-order subordination. In addition, we have encountered in the subjects' language second, third, fourth, fifth, sixth, and even seventh-order dependent clauses. If a rank-order system had been used, this would have meant assigning a weight of 52 points for a seventh-order dependent clause. The investigator felt that this would be unwise since a chance usage by a few subjects would tend to produce erratic fluctuations in the statistical findings.



### Elaboration Index Weights

| <u>Language Variable</u>                    | <u>Points</u> |
|---------------------------------------------|---------------|
| Adjective                                   | $\frac{1}{2}$ |
| Adverb                                      | $\frac{1}{2}$ |
| Compounding                                 | $\frac{1}{2}$ |
| Auxiliary                                   | $\frac{1}{2}$ |
| Possessive                                  | 1             |
| Determiner                                  | 1             |
| Topic <sup>1</sup>                          | 1             |
| Idiom <sup>2</sup>                          | 1             |
| Parenthetical <sup>3</sup>                  | 2             |
| Nominative Absolute                         | 2             |
| Prepositional Phrase                        | 2             |
| Modal                                       | 2             |
| Participle                                  | 2             |
| Gerund                                      | 2             |
| Infinitive                                  | 2             |
| Objective Complement                        | 3             |
| Appositive                                  | 3             |
| First-order Dependent Clause <sup>4</sup>   | 4             |
| First-order Participial Phrase <sup>4</sup> | 5             |
| First-order Gerund Phrase <sup>4</sup>      | 5             |
| First-order Infinitive Phrase <sup>4</sup>  | 5             |
| First-order Infinitive Clause <sup>2</sup>  | 5             |

<sup>1</sup> Topic: instances of repeated subjects such as The boy he was in the street or I knew that the girl she was my friend.

<sup>2</sup> Idiom: expressions with a meaning that cannot be derived from the conjoined meanings of the elements such as once upon a time, a couple of weeks ago, more or less, back and forth, a long time ago.

<sup>3</sup> Parenthetical: structures inserted within a communication unit such as I guess, I suppose, you might say, as it were, generally speaking.

<sup>4</sup> Dependent clauses and verbal phrases beyond first-order--second-order, third-order, etc.--received one additional point as the order of embedding increased. For example, a second-order dependent clause received five points; a second-order participial phrase received six points; a third-order dependent clause received six points; a third-order infinitive clause received seven points, etc.

Syntax: A Transformational Method of Analysis  
by John Dennis

In devising the categories of syntactic performance of students, I have been guided--or constrained--by the following evidence and studies:

- . . . four sets of protocols of the actual language used by selected students, each set consisting of approximately eighteen communication units (Loban)<sup>1</sup> or T-units (Hunt)<sup>2</sup>
- . . . the Bateman and Zidonis monograph,<sup>3</sup> "Transformational Syntax as a Model of Syntactic Structure" by Robert Stockwell,<sup>4</sup> and Roberts' Modern Grammar.<sup>5</sup>

Naturally, there is overlapping and contradiction among the studies. I have tried to find areas of agreement when they exist in some form; further, I have tried to reduce the number of transform "types" in order to avoid unreal or unnecessarily complex descriptions. My guide for theoretical decisions was the corpus of protocols provided me.

Of course the corpus under study really strains the resources of a "one-sentence grammar," no matter how much descriptive adequacy we attribute to that grammar. I say this because our corpus is discursive living language with all the natural language features we have come to expect of such material: rhetorical strategies in evidence, a high degree of recursiveness in structures, shifts in topic and register (level of "appropriate usage"), a certain number of hesitation phenomena, some deviations from rigidly described well-formed sentences, etc. Consequently, I have attempted to devise a description which ignores evident rhetorical concerns and focuses instead on syntactic performance.

As Chomsky and others are fond of pointing out, linguistic performance and linguistic competence ("surface structure" and "deep structure") are related but separate studies and scales. In a study of competence, we would be attempting to design a grammar which could account for the rules which specify the structural descriptions we could

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<sup>1</sup> Loban, op. cit.

<sup>2</sup> Hunt, op. cit.

<sup>3</sup> Donald R. Bateman and Frank J. Zidonis, The Effect of a Study of Transformational Grammar on the Writing of Ninth and Tenth Graders (Champaign, Illinois: National Council of Teachers of English, 1966).

<sup>4</sup> Robert Stockwell, Professor, University of California at Los Angeles.

<sup>5</sup> Paul Roberts, Modern Grammar (New York: Harcourt, Brace & World, Inc., 1967).

apply to sentences. In a study of performance we would attempt to describe the use of that grammar in a somewhat mechanical or "manipulative" way by showing the choices or options a speaker/hearer exercised in a given speech/writing sample. Necessarily, in a study of linguistic performance we would have to provide descriptive categories for syntactic deviations from a "center of expectancy"--for those mannerisms of speech which distinguish it from writing and for those shared features of speech and writing (e.g., parenthetical structures). The best thing to do at this point is to present categories, descriptions, and justifications.

### Single-Base Transforms

So far as I know, all single-base transforms involve two kinds of structural operations: (1) re-ordering of constituents in statements; and (2) insertion of optional incremental elements not derived from other statements. Statement here refers to what we have come to call "kernel" sentences which are characterized by the following criteria: they are statements; they are positive; they are active. We used to say that they were "irreducible," but in saying this, we were at a loss to explain items and phrases used adverbially. Since it is clearly simpler and sounder to consider words like there, then, and thus and their phrasal equivalents as aspects of phrase structure, (2) makes sense as an option available to kernels. A similar procedure must be followed in making incremental (wh-) questions; interrogatives like what, who(m), when, and where are simply optional attachments to the re-order or intonational shift underlying this type of (wh) question. The same argument applies to negation expressed by not + lexical verb.

- 1) T neg: NP + Aux + be + not +  $\begin{matrix} (NP) \\ (Adj) \\ (Adv) \end{matrix}$ ; NP + Aux + not + V  $\pm$  NP
- 2) T there: There + Aux + be + NP  $\pm \begin{matrix} (Adv) \\ (V-ing) \end{matrix}$
- 3) T yes/no: Aux + be + NP +  $\begin{matrix} (NP) \\ (Adj) \\ (Adv) \end{matrix}$ ; Do + tense + NP + V  $\pm$  NP
- 4) T wh- $\begin{matrix} (what) \\ (when) \\ (where) \end{matrix}$  + tense + do + NP + V ( $\pm$  NP); Who + tense + V  $\pm$  NP
- 5) T passive: NP<sub>1</sub> + Aux + V<sub>tr</sub> + NP<sub>2</sub>  $\rightarrow$  NP<sub>2</sub> + tense + be + part +  
V + by + NP<sub>1</sub>
- 6) T mobility: NP + Aux + V  $\pm$  NP + Prep Phr  $\rightarrow$  Prep Phr + S —



I don't think that we need to list citations illustrating these structural descriptions at this time. In this final report, we will do what Bateman and Zidonis have done, avoiding scrupulously the term transformational rules. They aren't rules at all; they are types of optional transforms.

### Multi-Base Transforms

When two or more single bases--kernels or their transforms--are used to make grammatical sequences of complex types, we can refer to them as multi-base transforms, thus avoiding the enumeration problem (double-base, triple-base, etc., which becomes tiresome). An alternative way of describing these derivations which result from various choices and subsequent manipulations is matrix/insert operations. Such a description makes good sense within the limits of a "one-sentence grammar," where constraints on the length and complexity of sentences used for analysis are likely. However, in the analysis of a discourse sample, a multiplicity of matrices and inserts is probable; consequently, there is a problem in description which can be avoided if we stick to a description of the structural manipulations performed. There doesn't seem to be a compelling reason for a double entry: e.g., The boy whom he saw at the game was his neighbor. This is a "double-base" (multi-base) transform using T<sub>sub</sub> (subordination). Its basic sentences are evident, and its transformational history is obvious. Need we add, then, that whom he saw at the game is also an insert sentence, surrounded by the matrix, The boy . . . . was his neighbor? It seems unnecessary to point out that when bases are combined they are either embedded or conjoined, with or without deletions.

Another feature of sentence analysis which I consider unnecessary--unless, of course, a highly detailed description of a "notional" kind is the analyst's aim--is the use of functional labels like "That + sentence as subject," "nominal infinitive of obligation," "abstractive nominal," "adverbial expansion of Man (adverb of manner) + C (presumably "complement," that catch-all term). First of all, what do these labels tell us? How are they "transformational rules"? Are they more or less accurate than descriptions of transformational types which are manipulated to produce grammatical sequences? These labels tell me that someone is trying to explain optional transformations in terms of traditional-school grammar. Chomsky spends a good deal of patient argument in Aspects of the Theory of Syntax<sup>1</sup> to discount the value of mixing functional labels with grammatical categories.<sup>2</sup>

<sup>1</sup> Noam Chomsky, Aspects of the Theory of Syntax (Cambridge, Massachusetts: MIT Press, 1965), pp. 68-74.

<sup>2</sup> These notional descriptions do, by indirection usually, locate the structural positions of constituents sometimes. Clearly none of Bateman and Zidonis' 46 "transformational rules" are rules at all; they are optional transformations. I think that notional labels are less accurate than categorical or typological descriptions if only because these labels are vulnerable: i.e., Is it "obligation" or "causality"? Is the "object of the verb" also the "subject of the infinitive"? and so on.

I will sum up my argument this way: If we are interested in developing a "syntactic profile" of a given student, student group, or "level" in school, we can surely obtain that information without recourse to matrix/insert counts or notional labels. For example, recurrent syntactic structures could be generalized abstractly this way: This student/ group / grade tends to conjoin more frequently than he/it tends to embed. More specifically we could say that conjoining structures were used 57 percent of the time in all units analyzed; and, but, and or were so used in relative order of frequency. Suppose the reverse were true; then we could specify the types of embedded transforms: relative, subordinate, appositive, etc., depending on how we specified deletion.

### Multi-Base Transforms (full forms)

The term full form means that the entire transformation is intact; there has been no deletion.

- $$\left\{ \begin{array}{l} 1) \text{ T conj. } S_1 \begin{array}{c} \text{(and)} \\ \text{(but)} \\ \text{(or)} \end{array} S_2; \text{ IC}_1 \begin{array}{c} \text{(and)} \\ \text{(but)} \\ \text{(or)} \end{array} \text{ IC}_2 \\ \dots \\ 2) \text{ T con(nector) } S_1 \begin{array}{c} \text{(therefore)} \\ \text{(however)} \\ \text{(consequently)} \end{array} S_2 \\ \dots \\ 3) \text{ T rel(ative) } [S_1 \begin{array}{c} \text{(who)} \\ \text{(which)} \\ \text{(that)} \\ \text{(whose)} \end{array} + \text{Aux} + \text{VP} \dots ] \\ \dots \\ 4) \text{ T sub(ordinate) } [S_1 (+ \text{sub} + S_2) \dots ] \\ 5) \text{ T pro } \begin{array}{l} (\text{It} + \text{Aux} + \text{be} + \text{Adj} + \text{sub} + \text{S} \dots) \\ (\text{I} + \text{Aux} + \text{be} + \text{Adj} + \text{sub} + \text{S} \dots) \end{array} \end{array} \right.$$

- 6) T for-to\* For + NP + to + V + VP . . .

\* #5 often combines here: It + Aux + be + Adj +  
for + NP + to + VP

- 7) T to NP + Aux + V<sub>tr</sub> + NP + S<sub>2</sub>

→ John wanted NP + John + tense + come

→ John wanted  $\emptyset$  + to + come

8) T nom NP +  $\begin{pmatrix} (V_{intr}) \\ (V_{tr}) \end{pmatrix}$  ± NP / NP + be +  $\begin{pmatrix} (Adj) \\ (Adv) \end{pmatrix}$  →

NP + grow  
NP + grow + NP / NP is interesting →

also The growing of flowers is interesting  
--- flying -- kites can be troublesome

9) T comp NP + V<sub>tr</sub> + comp. + VP →

They consider he is foolish him →  
They consider him (to be) foolish

10) T mob(ility) I like him because he is honest →  
Because he is honest I like him  
(Many other examples are possible here)

A question may arise about the presence of to and -ing in #6, 7, and 8. Is there a syntactic change here or a "phonological" (morphological, really) one? A similar question occurs in structures like John + possessive + V-ing or his + V-ing: should we search for a syntactic or a non-syntactic explanation? In the first case I would say that the obligatory rule for tense can be rewritten as to or -ing, thus obviating the T<sub>ing</sub> and T<sub>del(etion)</sub>, ing, poss string that Roberts winds himself up in. Also, in the second case, I think that John has a hotrod will produce John's hotrod but not John's hotrodding which more likely comes from John + tense + hotrod → John + poss + -ing + hotrod → John + S + hotrod + ing . . . (→ a spelling rule, no doubt). #6 and #7 are different enough to require different explanations, it seems to me.

#### Multi-Base Transforms (deleted forms)

It is apparent to those of us who have examined the natural uses of language that deletions of certain items and structures is commonplace in both speech and writing. Deletion is often treated as a transform, a single type of generalized option. In a way that's sensible, but I don't think we've treated it systematically enough. Deletion is like the recursive rule: it can be applied indefinitely to certain strings in a given environment; and so long as the specifications are correctly followed, grammatical sequences will result. In fact, specifying the deletion operation precisely allows us to avoid the following problem:

The lad is handsome  
The lad is interesting (to me)  
The lad is sleeping

The application of T rel(ative), who + is +  $\begin{pmatrix} (Adj) \\ (V-ing) \end{pmatrix}$ , yields a



non-sentence (a "noun cluster," if you like). The deletion rule specifies relative  $\rightarrow \emptyset$  and Aux  $\rightarrow \emptyset$ , leaving handsome, interesting, and sleeping. We now have a classification problem which is partially structural (very + a given word > + adjective or - adjective) and partially semantic (attributive = a "property" of the NP or non-attributive = "accidental" or "imputed"). Very handsome and very interesting, but not very sleeping. Further, we must say handsome / interesting lad. We can say sleeping lad or lad sleeping. In terms of a student's performance, we have only one real concern: did he or did he not make the deletion so that a grammatical sequence was the result? And the same question would apply to any deletion he attempted: does the grammar specify it as possible? Did the student's use of it result in a grammatical sequence?

To sum up, then, we should be interested in his uses of the various kinds of deletions as he applies them to items and structures in the sentences he generates.

- 1) D NP                       $NP_1 + VP_1 + \text{conj} + NP_1 + VP_2 \rightarrow NP_1 + VP_1 + \emptyset + VP_2 \rightarrow$   
     [env. T conj]              Mr. Smith bent over and tied his shoelace.
- 2) D rel + Aux              The man who is sick  $\rightarrow$  The man sick  $\rightarrow$  The sick man  
     [env. T rel]              The girl who is crying  $\rightarrow$  The girl crying  $\rightarrow$   
                                 The crying girl  
                                 The man who is smoking  $\rightarrow$  The man smoking -----

Note 1: The same operation applies to strings which have undergone the passive - T passive:

The man who was injured  $\rightarrow$  The man injured -----  
 The man who was frightened  $\rightarrow$  The man frightened  $\rightarrow$   
 The frightened man.

Note 2: There is an inversion rule operative here, but it applies with consistency only to "attributives." With -ing forms, there is divided usage.

Note 3: This D rule also accounts for the appositive.

- 3) D NP + V                      The class elected comp. John  $\rightarrow$   
     [env. T comp]              The class elected John became president John  
                                 \*The class elected  $\emptyset$                $\emptyset$               president John

\*Note: An inversion rule is obligatory here.

- 4) D NP + for                      For NP to solve the problem + VP  
     [env. T for-to]               $\emptyset$      $\emptyset$  To solve the problem is easy.

- 5) D sub.           The man whom I saw . . . →  
     [env. T sub]    The man    ∅   I saw

Note: Only the "relatives," who, which and that, can be deleted in T sub; whose must be used, and the other subordinators are also obligatory.

- 6) D conj                   This is obvious and will lead to a series of NPs,  
     [env. T cong-and]   attributes, verbs, etc.

- 7) D VP                    I am taller than he is tall →  
     [env. T compar.]    I am taller than he is ∅  
                           or I am taller than he ∅ ∅

Note: I did not list T compar. with multi-base "full forms" because it is never a full form except in such oddities as He is as handsome as she is ugly--which doesn't strike me as a comparison, but rather as a variant form of the contrast: He is handsome but she is ugly.

- 8) D V                    I enjoy chess, and John enjoys chess (too)  
     [env. T conj.]    I enjoy chess, and John    ∅   does too  
                           I enjoy chess, and so does John.

### Performance Deviations

We can take care of the various deviations in performance under three rubrics: (1) mazes; (2) sequence interrupters and parenthetical structures; (3) syntactic deviations. Two of these can in the sense of hesitation phenomena be called deviations of some kind. (See the article by Iris Sokolott Shah on "Linguistic Decision Points and Encoding Segments in Spoken English.") The third is well-known.

- (1) Mazes: I should think that two kinds of evidence might be useful here.

- (a) Kinds of maze structures = item, phrase, clause  
 (b) Movement = complete break-off (aposiopesis) or stop-revision (anacoluthon).

### (2) Sequence Interrupters and Parenthetical Structures

- (a) Sequence Interrupters: I think of these as non-initial. When they are initial (before communication units), they tend to move the discourse along. When they are internal, they usually represent a pause for decision-making. Their position interests me, too, and I would chart them thus:

| <u>Type</u> | <u>Position</u>     |
|-------------|---------------------|
| uh          | NP: medial/terminal |
| um          | VP: medial/terminal |
| well        | Inter-sentence      |
| ....        |                     |

(b) Parenthetical Structures:

1) S + deletion: let's see  
you see  
you know  
I would think  
you might say  
as it were

2) frozen items and phrases: as a matter of fact  
for that matter  
of course  
in other words  
generally speaking  
in my opinion

(3) Syntactic Deviations

- (a) Non-sentences
- (b) Word order: items or structures out of sequence
- (c) Number: non-agreement on NP + VP  
pronoun reference: NP<sub>sing</sub> → Pro<sub>pl</sub>
- (d) Preposition or particle: to → on  
with → to
- (e) Deletions: article omitted; connective omitted, etc.
- (f) Tense shift: narrative past → narrative present  
He went → He goes . . .
- (g) Other: (one always needs an etc.)

In offering here a sketch and suggestions for procedures, I think the analyst could mark the protocols, using brackets to enclose the segments of language that he is classifying and labeling the bracketed material so that he can make a quick tally of transformational types after he has finished his analysis. Let me present a typical problem. Suppose a student has used T passive. Then T relative, and finally D Rel + Aux. How would the analyst judge and mark this material? I would say that the final structure would be coded--i.e., D rel + Aux because this "result" implies the underlying transformational history. Thus the past participle used as a modifier and so specified by D rel + Aux reveals a hierarchy of manipulative skills as a review of its transformational history confirms. I think that this procedure plus



judgment will stand up under scrutiny in most cases. It's rather a novel idea, and I encourage inquiry. In any case, I fail to see that the entire transformational history I've just described could be coded without giving a curious imbalance to the syntactic profile we wish to obtain.

Unless there is a desire to see what a given student has done within any specific communication unit, I see no reason for describing the locus of optional transforms as unit 1, unit 6, etc.<sup>1</sup> I think that one page of code symbols for one set of protocols (30 T-units) would be sufficient. However, a master tally sheet for a student, a student group, or a "level" of instruction (or achievement) would probably have to be more complex.

Of course, in this proposal I know that I have not said all that needs to be said about the scheme for analysis and description of the optional transforms that students use in casual discourse. However, I do believe that I have said enough to make an accurate and productive analysis possible.

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#### Verbs: Method of Analysis

Every language is complex in some ways and simple in other ways. Polish and Finnish morphemes are difficult for a foreigner as are German nouns. English is relatively simple in everything except its verb system, one of the most subtle and elaborate among Western languages. Even so, mastering the system of verbs in any language is crucial to knowing and using that language. Quite intuitively, one senses that a study of predication should reveal something useful, in this research, concerning the subjects' ability or proficiency with language. For instance, the authors of Writing: Unit-Lessons in Composition<sup>2</sup> state:

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<sup>1</sup> In the present research it was not feasible to use the specific recommendations made by Professor Dennis in reference to bracketing transformations on the protocols, for example. Each communication unit was typed individually on a sheet of paper, the transformational analysis was done for that specific unit on that same sheet. Eventually, a master tally sheet was made for each subject for thirty units per grade (for grades one, two, and three and ten, eleven, and twelve).

<sup>2</sup> Don P. Brown, Thomas D. Kowalski, Bernard R. Tanner, and Melvin E. Tuohey, Writing: Unit-Lessons in Composition (New York: Ginn and Company, 1964), p. 51.

"Verb density" refers to the number of verbs or verbals as compared to the total number of words in the selection. Writing that has a low verb density contains too few verbs or verbals; writing that has a high verb density has a large number of verbs in relation to the total number of words. In general, the higher the ratio of verbs and verbals to the total number of words, the clearer the writing is likely to be.

"Computing verb density is not meant to be scientific. No mathematical formula can tell you exactly how clear a piece of writing is; your own judgment must give you that answer. Nevertheless, when you find that a piece of writing seems unclear, you will often discover that it has a low verb density. A low verb density results when there is only one verb or verbal for every nine or more words (1:9). A high verb density occurs when there is one verb for every five to eight words (1:5 to 1:8).. The value of this formula is that it gives you the means to check the verb density of a passage after you sense a vagueness, awkwardness or confusion in the writing."<sup>1</sup>

Another aspect of the verb, one not studied in this research, is lexical. Do those with power over language use more vivid, unusual, and precise verbs than those who lack language skill? For instance, the following contrasts:

The boys went down to the lagoon to swim.  
The boys streaked down to the lagoon to swim.  
He went across the street.  
He ambled (lurched, strode, shuffled) across the street.

This seems an important study for the future. Because such research is time-consuming, no attempt was made in this project to determine such matters.

In one study of written English<sup>2</sup> using modern plays, novels, non-fiction, and periodicals, the use of expanded verb forms proved less

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<sup>1</sup> To determine the verb density of a written selection, the above authors suggest the following: count all verbs and verbals, counting as one verb any group of verbs or verbals which operate together as a single part of speech. For example, can serve counts as one verb because it is a verb phrase; is to serve counts as two verbs because to serve is an infinitive which complements is. However, in the present research the investigator counted every verb word individually. For example, can serve is counted as two verb words; is to furnish is counted as two verb words (omitting the to); will have served is counted as three verb words; would have liked to furnish is counted as four verb words.

<sup>2</sup> Robert L. Allen, The Verb System of Present-Day American English (The Hague: Mouton & Company, 1966).

common than supposed; only 211 verb forms out of 4800 were expanded forms. The present research deals with the oral and written language of children and adolescents; the special study of verbs examines finite and non-finite verbs used in both dependent and independent clauses. A finite verb is one requiring a subject and capable of taking a subject from this list: it, I, we, you, he, she, they. Finite verbs are those that may occur as the only verb forms in independent clauses. Non-finite verbs (infinitives, participles, gerunds) occur only with finite forms in independent clauses, but some of them may occur alone in dependent clauses. All verbs used in the thirty selected units of communication were identified, recorded on individual tally sheets, and then statistically tabulated.



### PART III. STATISTICAL DESCRIPTION OF THE SAMPLE

#### The Sample Population

For purposes of this monograph the statistical description of the sample will be limited to the High, Low, and Random groups (each N = 35).

#### Socio-Economic Status, Sex, Ethnic Background, and I.Q. Scores

To determine the socio-economic status of each subject in the research, the occupations of both parents (or legal guardians) were determined.<sup>1</sup> These occupations were then classified according to the Minnesota Scale for Paternal Occupations.<sup>2</sup> Once this was accomplished, each subject fell into one of the seven major socio-economic categories comprising the Minnesota Scale:

- I. Professional
- II. Semi-professional and managerial
- III. Clerical, skilled trades, and retail business
- IV. (The Minnesota Scale reserves this category for all farmers)
- V. Semi-skilled occupations, minor clerical positions, and minor business
- VI. Slightly skilled trades and other occupations requiring little training or ability
- VII. Day laborers of all classes (and families whose sole livelihood was public assistance)

Note that even though the present study is an all-urban sample, some subjects fall into category IV since the socio-economic ratings reflect the average of both parents' occupations.<sup>3</sup>

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<sup>1</sup> In the investigation the socio-economic ratings were carried out by two judges, and in cases of disagreement (which were actually negligible) the investigator himself provided a third judgment.

<sup>2</sup> The Minnesota Scale contains approximately 500 occupations rated on a seven-point scale. It was developed at the Institute of Child Welfare, University of Minnesota, as a basis for classifying persons into socio-economic groups at a time when the Institute was looking for an instrument which would enable it to secure a cross-section of the population. (See The Minnesota Scale for Paternal Occupations, Institute of Child Welfare, University of Minnesota, University Press, n.d.).

<sup>3</sup> Typically a socio-economic rating of IV was the result of a mother who was a skilled clerical worker (III) and a father who was a semi-skilled factory worker (V), resulting in the average of IV as the family socio-economic rating.

Table 1 presents the socio-economic data by sex and ethnic background for the High, Low, and Random groups. High socio-economic status is obviously a crucial determiner for entry into the High group whereas in the Low group the majority are of low socio-economic status. In reference to I.Q. scores, the same obvious generalization holds true, with high I.Q. scores centered in the High group and low I.Q. scores in the Low group. As we would expect, the Random group has a median I.Q. of 100. (See Table 2.)

In the overall group of subjects ( $N = 211$ ), 51.20 percent were Caucasian, 40.77 percent Negro, and 8.03 percent Oriental. Thus it would appear that black subjects comprise a disproportionately low percentage of the High group and a disproportionately high percentage of the Low group. On the other hand, the five black subjects in the High group show a greater ability to overcome low socio-economic status than do their white counterparts in this research. And from this, as well as from the performance and ability of a number of other black subjects in the research, the investigator believes that the ways of studying the language abilities of black children are not yet developed. We need more refined research measures to eliminate the pronounced cultural bias.<sup>1</sup>

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<sup>1</sup> In the computerized study (discussed in PART IV of this monograph) a group of ten black subjects was discovered with high language ability which went unmeasured by the typical measures.

TABLE 1

## SOCIO-ECONOMIC STATUS BY ETHNIC GROUP AND SEX

High Group

| Socio-Economic Status | I  | II | III | IV | V | VI | VII | Total |
|-----------------------|----|----|-----|----|---|----|-----|-------|
| Caucasian Male        | 7  | 2  | 4   | 1  | 2 | 0  | 0   | 16    |
| Caucasian Female      | 3  | 5  | 3   | 0  | 0 | 0  | 0   | 11    |
| Negro Male            | 0  | 0  | 0   | 0  | 0 | 0  | 0   | 0     |
| Negro Female          | 0  | 0  | 0   | 2  | 3 | 0  | 0   | 5     |
| Oriental Male         | 0  | 0  | 1   | 0  | 0 | 0  | 0   | 1     |
| Oriental Female       | 0  | 0  | 0   | 0  | 2 | 0  | 0   | 2     |
| Total                 | 10 | 7  | 8   | 3  | 7 | 0  | 0   | 35    |

Random Group

| Socio-Economic Status | I | II | III | IV | V | VI | VII | Total |
|-----------------------|---|----|-----|----|---|----|-----|-------|
| Caucasian Male        | 1 | 2  | 5   | 2  | 2 | 0  | 0   | 12    |
| Caucasian Female      | 0 | 2  | 2   | 0  | 2 | 1  | 1   | 8     |
| Negro Male            | 0 | 0  | 0   | 1  | 1 | 1  | 0   | 3     |
| Negro Female          | 0 | 0  | 0   | 1  | 0 | 6  | 1   | 8     |
| Oriental Male         | 0 | 0  | 1   | 0  | 1 | 0  | 0   | 2     |
| Oriental Female       | 0 | 0  | 0   | 0  | 2 | 0  | 0   | 2     |
| Total                 | 1 | 4  | 8   | 4  | 8 | 8  | 2   | 35    |

Low Group

| Socio-Economic Status | I | II | III | IV | V  | VI | VII | Total |
|-----------------------|---|----|-----|----|----|----|-----|-------|
| Caucasian Male        | 0 | 4  | 1   | 1  | 1  | 0  | 0   | 7     |
| Caucasian Female      | 0 | 0  | 0   | 1  | 1  | 2  | 0   | 4     |
| Negro Male            | 0 | 0  | 0   | 2  | 0  | 6  | 1   | 9     |
| Negro Female          | 0 | 0  | 0   | 0  | 4  | 7  | 0   | 11    |
| Oriental Male         | 0 | 0  | 0   | 0  | 2  | 0  | 0   | 2     |
| Oriental Female       | 0 | 0  | 0   | 0  | 2  | 0  | 0   | 2     |
| Total                 | 0 | 4  | 1   | 4  | 10 | 15 | 1   | 35    |



TABLE 2

KUHLMAN-ANDERSON I.Q. SCORES<sup>1</sup>  
(median and range)

|                     | <u>Median</u> | <u>Range</u> |
|---------------------|---------------|--------------|
| <u>High Group</u>   | 116           | 99 to 133    |
| <u>Random Group</u> | 100           | 72 to 124    |
| <u>Low Group</u>    | 88            | 68 to 107    |

<sup>1</sup> For most subjects, there were available either two, three, or four separate Kuhlman-Anderson I.Q. scores. The mean was first calculated for each subject before the median scores were determined for the group.

#### PART IV: PREDICTION AND EVALUATION OF LANGUAGE GROWTH

The investigator has participated during the past several years in a study which begins the use of this longitudinal data for prediction of language development. This second research is a computerized analysis; data on grades one, two, and three are used to predict data obtained in grades ten, eleven, and twelve. The findings on this second study are reported in a separate monograph.<sup>1</sup>

All prediction of human behavior raises questions of concern, apprehensions that control may follow prediction. We hope human beings will not be suited to manipulation by power-loving social engineers. We hope, also, that prediction studies in language will contribute to better instruction of the kind that links language growth to independent thinking.

This second research project uses three aptitude variables (I.Q. scores, teachers' ratings, and kindergarten vocabulary test scores) and five language variables (average number of words per communication unit, maze words as a percentage of total words, dependent clause ratio, weighted index of elaboration, and use of conventional English usage). After extensive preliminary testing, the computer program most suitable to the data was selected. The Friedmann-Rubin program, using a carefully designed system of matching the various subjects, located a total of eight subgroups, each with unique language characteristics.

In this predictive study the 211 subjects from the total longitudinal investigation are classified into groups by their similarities in language behavior in grades one, two, and three. On the basis of this classification and language data generated at grades ten, eleven, and twelve, we show how these unique language behaviors either change and evolve with age to a new adult language style or remain fixed over time. An attempt is made to determine whether language behavior represents an early conditioned verbal response of each individual or whether it is fluid, changing with age and experience.

The statistical procedures used for this analysis and testing are included in the broad framework of canonical correlation, principal components, statistical clumping procedures, multivariate analysis of variance, and linear discriminant analysis.

The computer analysis indicates that the eight groups<sup>2</sup> grow closer together on length of communication unit, use of dependent clauses, and

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<sup>1</sup> Leonard A. Marascuilo and Walter Loban, An Empirical Study of the Dominating Predictive Features of Spoken Language in a Representative Sample of School Pupils: A Multivariate Description and Analysis of Oral Language Development (report to the U.S. Office of Education on Project Number 7-I-106, 1969).

<sup>2</sup> The reader should note that these eight groups are not the three groups discussed throughout the rest of the present monograph.

elaboration of units. Nevertheless, those who began their schooling with low scores on these oral language measures never reach the proficiency of those who began with high scores. On the use of standard English, the eight groups do not grow closer together from the primary grades to the final years of high school. Those subjects who hear and use non-standard speech at home continue to use the same models or standards throughout their school lives. Conventionality scores for grades one, two, and three are almost identical to conventionality scores for grades ten, eleven, and twelve. On the other hand, mazes diminish as a problem until all eight groups converge to a degree where no genuine differences exist among them. However, in our longitudinal study, where we have a High, Random, and Low group, only the High and Random groups converge. The Low group has a greater proportion of maze words.

#### Evaluation of Language Development

From this research we learn that in the elementary school each of the five language variables is a separate entity. In evaluating primary school children's language, then, one would wish to use measures of all five. Since very little evaluation of oral language has been accomplished in American education, or in world education, new devices such as the use of tapes and recorders will need to be introduced. Because this kind of evaluation is time-consuming, schools may need to select random samples for evaluation and employ teacher aides.

Another way of overcoming the time-consuming block to evaluation of oral language might be to combine some of the five variables and then to see if any one of the combined variables could serve by itself. Mazes and conventionality of speech, of course, must stand by themselves; however, length of communication unit, elaboration of communication unit, and use of dependent clauses may be similar enough to provide a way to simplify the problem.

As one can easily observe by examining the data, dependent clause measures are highly correlated with elaboration measures and length of unit (fluency). At grades one, two, and three the values of these correlations are given by  $r_{EF} = .80$  and  $r_{ED} = .82$ . These high correlations make sense, of course, because elaboration of simple subject and predicate in the units of communication increases the length of the units and the incidence of dependent clauses. Because the measurement of elaboration is complex and time-consuming, it is reasonable to speculate as to whether or not elaboration could be predicted with any reliability from the more easily determined unit length (fluency) and dependent clause statistics. To determine whether such a prediction possesses an acceptable level of reliability, a multiple regression analysis was performed on the elaboration index at grades one, two, and three--combined with unit length (fluency) and dependent clauses as the predictor variables. The results of this analysis are summarized in Table 3. According to this analysis, the prediction is of considerable reliability. The multiple correlation coefficient is given by  $R_{E.FD} = .89$  with the prediction



TABLE 3

MULTIPLE REGRESSION ANALYSIS OF ELABORATION INDEX ON FLUENCY AND  
DEPENDENT CLAUSES MEASURED AT GRADES ONE, TWO, AND THREE

| Variable          | Regression<br>Coefficient | t-value | Decision <sup>1</sup> |
|-------------------|---------------------------|---------|-----------------------|
| Fluency           | .41                       | 10.9    | Significant           |
| Dependent Clauses | .53                       | 12.4    | Significant           |

<sup>1</sup> Significant at  $\leq .05$

equation given by

$$E = 3.00 + .41F + .53D$$

in which E represents elaboration, D represents dependent clauses, and F represents fluency (or unit length). The standard error for the estimated elaboration index is given by  $SE = 3.72$ . On the basis of these results, Table 4 has been prepared. From this table a researcher or a teacher can estimate a primary school pupil's elaboration index score from the observed standardized fluency and dependent clause statistics. Also, the 95 per-cent confidence interval for the true elaboration index score can be determined by adding and subtracting seven points from the predicted value. For example, if  $T_F = 40$  and  $T_D = 60$ , then the predicted elaboration index score is given  $T_E = 41 \pm 7$ . As another example, suppose  $T_F = 34$  and  $T_D = 58$ . To estimate the elaboration index, use  $T_F = 49 \pm 7$ . In other words, use the closest values in Table 4 when  $T_F$  or  $T_D$  fall between the intervals we have provided there.

Thus it is important, both for research and for classroom evaluation of oral language, to know that in grades one, two, and three a count of the two elements

- . . . . length of communication unit
- . . . . number of dependent clauses

will serve just as effectively as a count of all three language variables. The complex elaboration index which includes all syntactic devices (such as infinitive clauses, appositives, gerunds, adjectives, etc.) may be omitted. A similar multiple regression analysis needs to be performed for the upper elementary grades, junior high, and senior high school. Examination of the data indicates that this simplification may not work for oral language in the upper years or for written language at any point of schooling. Also, in a class of thirty-five pupils, a random sample of eleven pupils might give a picture of the class as a whole.

TABLE 4

PREDICTED ELABORATION INDEX STANDARDIZED VALUE FROM OBSERVED  
STANDARDIZED FLUENCY AND DEPENDENT CLAUSE SCORES

| Dependent<br>Clause Score | Fluency Score <sup>1</sup> |    |    |    |    |    |    |    |    |
|---------------------------|----------------------------|----|----|----|----|----|----|----|----|
|                           | 30                         | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 |
| 30                        | 31                         | 33 | 35 | 37 | 39 | 42 | 44 | 46 | 48 |
| 35                        | 34                         | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 |
| 40                        | 37                         | 39 | 41 | 43 | 45 | 47 | 49 | 51 | 53 |
| 45                        | 39                         | 41 | 44 | 46 | 48 | 50 | 52 | 54 | 56 |
| 50                        | 42                         | 44 | 46 | 48 | 50 | 52 | 54 | 56 | 58 |
| 55                        | 44                         | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 |
| 60                        | 47                         | 49 | 51 | 53 | 55 | 57 | 59 | 61 | 64 |
| 65                        | 50                         | 51 | 54 | 56 | 58 | 60 | 62 | 64 | 66 |
| 70                        | 52                         | 54 | 57 | 59 | 61 | 63 | 65 | 67 | 69 |

$$^1 T_E = \frac{T_{E1} + T_{E2} + T_{E3}}{3} = 50 + 10 \left\{ \frac{1}{3} \left[ \frac{X_{E1} - 75.4}{27.6} + \frac{X_{E2} - 81.6}{24.8} + \frac{X_{E3} - 89.4}{27.4} \right] \right\}$$

$$T_F = 50 + 10 \left\{ \frac{1}{3} \left[ \frac{X_{F1} - 6.0}{1.39} + \frac{X_{F2} - 6.5}{1.38} + \frac{X_{F3} - 6.9}{1.32} \right] \right\}$$

$$T_D = 50 + 10 \left\{ \frac{1}{3} \left[ \frac{X_{D1} - .07}{.04} + \frac{X_{D2} - .07}{.04} + \frac{X_{D3} - .06}{.04} \right] \right\}$$



## PART V: RESULTS OF THE INVESTIGATION -- BASIC MEASURES

### Fluency with Oral Language

Fluency with oral language generally connotes a readiness to express oneself combined with a smooth, easy flow of words such as is frequently present in the language of statesmen or public speakers. In the language of children, however, one cannot expect to find the same degree of proficiency. Even at the high school level, children obviously lack the polish and rhetorical skill of the trained public speaker; and in examining their language one must search for less polished indications of their fluency--for evidence pertaining to their volume of language, length of communication units, and freedom from language tangles which tend to limit the effectiveness of communication.

As the investigator has indicated previously, the findings on oral language have been derived from the subjects' elaboration data sheets (thirty units per subject per year). Thus, no separate tables have been presented on the volume of spoken language since these would merely consist of sets of numbers which would then be divided by 30 in subsequent tables.<sup>1</sup> Two measures, however, are important: the average number of words per communication unit and maze words as a percentage of total words.

### Average Number of Words per Communication Unit -- Oral Language

A high average number of words per communication unit could simply be the result of verbosity--a greater use of language without any significant increase in meaningful communication. In this research, however, this has not proved to be the case. Almost without exception, a high average words per unit is accompanied by a high teacher's rating on language skill, by a wider use of phrases and clauses, and by the use of other forms of elaboration contributing to clear and meaningful communication. For this reason the average number of words per communication unit has proved to be one of the most crucial measures of fluency developed during the course of the investigation.

The Data: The data on average number of words per communication unit indicate a relatively steady upward progression for each group. (See Table 5 and Figure 1.) The lines on the graph do not cross or even come close to crossing, and in grade twelve the High group exhibits virtually the same degree of superiority it showed in grade one. Thus, from the standpoint of obtaining a simple, straightforward method to measure the degree of fluency with language, the average number of words per communication unit appears to be an exceptionally good device.

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<sup>1</sup> A subject who had 8 words per unit would simply have 240 words in total ( $8 \times 30$ ); a subject who had 10 words per unit would have 300 words in total ( $10 \times 30$ ); etc.

TABLE 5

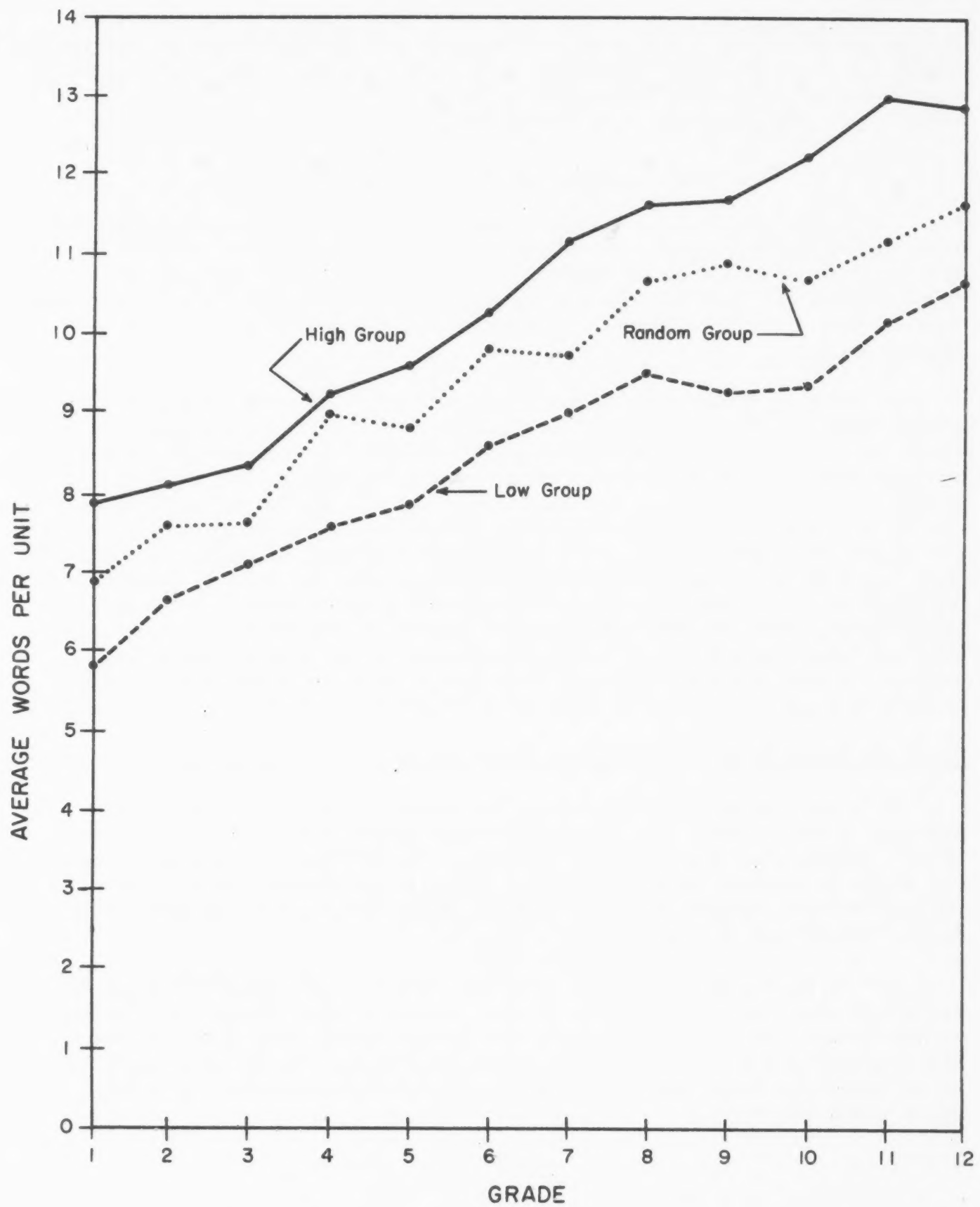
## AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT -- ORAL LANGUAGE

| Grade | Average Number of Words per Communication Unit (mean) |              |           | Relative Growth <sup>1</sup> (in percent) |              | Year-to-Year Velocity <sup>2</sup> (in percent) |           |
|-------|-------------------------------------------------------|--------------|-----------|-------------------------------------------|--------------|-------------------------------------------------|-----------|
|       | High Group                                            | Random Group | Low Group | High Group                                | Random Group | High Group                                      | Low Group |
| 1     | 7.91                                                  | 6.88         | 5.91      | 67.61                                     | 58.80        | --                                              | --        |
| 2     | 8.10                                                  | 7.56         | 6.65      | 69.23                                     | 64.62        | +1.62                                           | +6.33     |
| 3     | 8.38                                                  | 7.62         | 7.08      | 71.62                                     | 65.13        | +2.39                                           | +3.67     |
| 4     | 9.28                                                  | 9.00         | 7.55      | 79.32                                     | 76.92        | +7.70                                           | +4.02     |
| 5     | 9.59                                                  | 8.82         | 7.90      | 81.97                                     | 75.38        | +2.65                                           | +2.99     |
| 6     | 10.32                                                 | 9.82         | 8.57      | 88.21                                     | 83.93        | +6.24                                           | +5.73     |
| 7     | 11.14                                                 | 9.75         | 9.01      | 95.21                                     | 83.33        | +7.00                                           | +3.76     |
| 8     | 11.59                                                 | 10.71        | 9.52      | 99.06                                     | 91.54        | +3.85                                           | +4.36     |
| 9     | 11.73                                                 | 10.96        | 9.26      | 100.26                                    | 93.68        | +1.20                                           | +2.22     |
| 10    | 12.34                                                 | 10.68        | 9.41      | 105.47                                    | 91.28        | +5.21                                           | +1.28     |
| 11    | 13.00                                                 | 11.17        | 10.18     | 111.11                                    | 95.47        | +5.64                                           | +6.58     |
| 12    | 12.84                                                 | 11.70        | 10.65     | 109.74                                    | 100.00       | -1.37                                           | +4.02     |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.

FIGURE 1

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT -- ORAL LANGUAGE  
(mean)





Stages and Velocity: Stages of growth are most clearly discernible in the Random group. Virtually without exception, a year of growth is followed by a plateau and then by another year of growth. Thus, the pattern for the Random group (the typical subject) appears to be one of a high velocity of growth followed by a consolidation which is not clearly evidenced by either the High or Low group except in grades nine through twelve.

Relative Growth: The relative growth of the three groups uses the Random group at grade twelve as 100 percent and is calculated in the same manner as the cost of living index or similar indices. The most valuable characteristic of the relative growth data is that it enables one to see clearly percentage comparisons among the groups.

#### Prediction and Crucial Characteristics

Since the research is longitudinal in nature, it is essentially both descriptive and predictive simultaneously. In other words, we know in advance exactly how a cross-section of subjects did in fact perform throughout a twelve-year period, and from the accumulated data we can then predict that similar subjects in other urban areas will perform in a similar manner.

The most crucial characteristic pertaining to average words per unit is the huge difference in ability exhibited by the groups--a difference which does not appear remarkable from the graphic presentation but which becomes more obvious when one examines the statistical data in Table 5. In grade one, for example, the High group has an average of 7.91 words per communication unit; this level of achievement is not reached by the Low group until grade five. Or, looking at a second example, one can see that the High group has an average of 10.32 words per unit in grade six and this is not equaled by the Low group until grade eleven or twelve. Large divergences between the High and Random or the Random and Low are also obvious; therefore, as a generalization we may state that a High subject is approximately four or five years ahead of a Low subject and between one and three years ahead of a Random (typical) subject.

#### Words in Mazes as a Percentage of Total Words -- Oral Language

As a percentage of total words the number of words in mazes is actually a very simple and straightforward device for measuring the subjects' repetitions and language tangles. For example, if a subject had 450 words in communication units and 50 words in mazes--for a total of 500 words--the calculation would result in a figure of 10 percent (50/500) as his percentage of maze words.

The first feature apparent from the data is that the High group consistently shows a lesser degree of maze behavior than either the Random or Low group. As we might expect, the Random group falls between the High and Low groups, with the Low group exhibiting the greatest difficulty in reference to this barrier to easy, effective communication. (See Table 6 and Figure 2.)

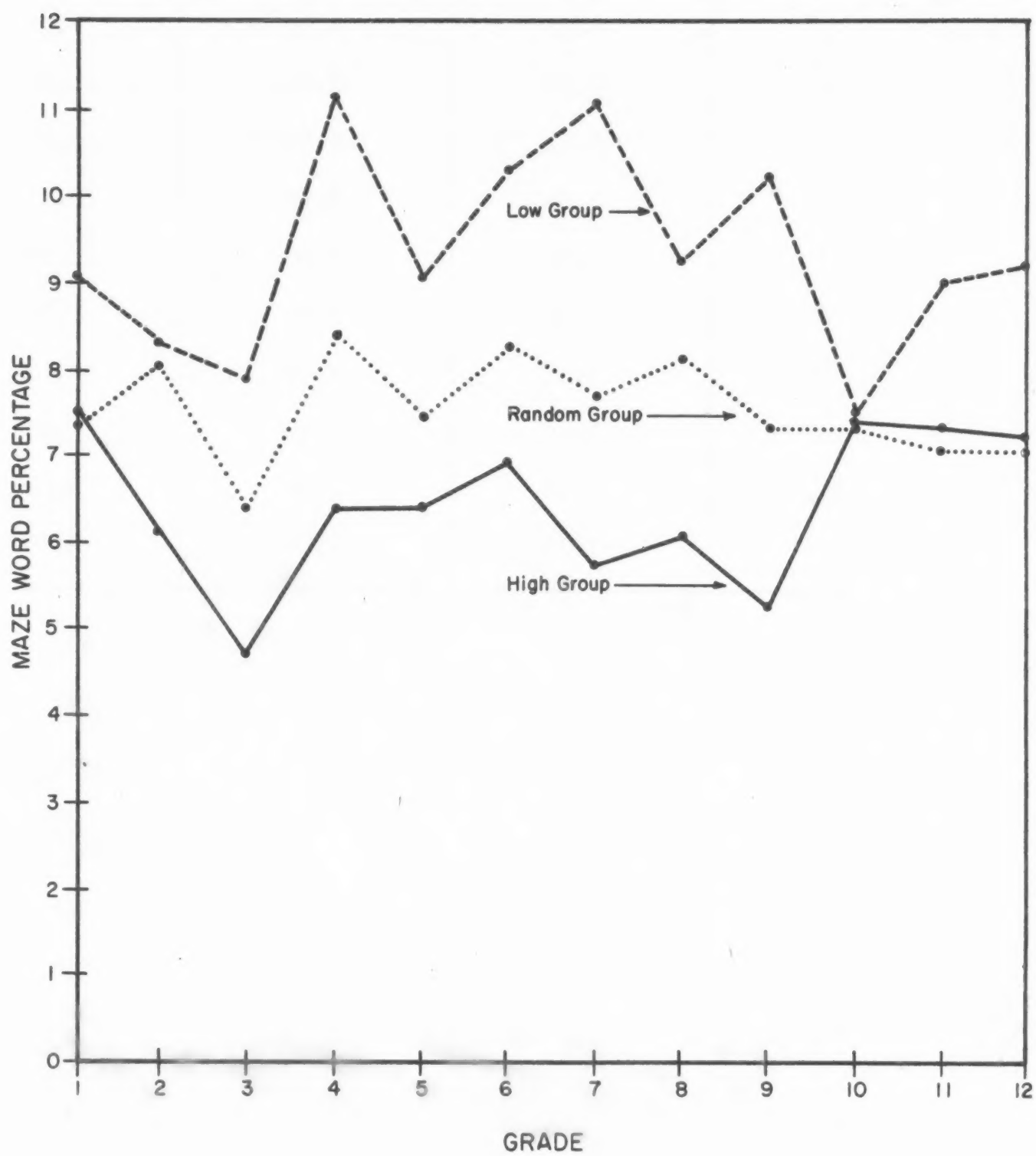
TABLE 6

MAZE WORDS AS A PERCENTAGE OF TOTAL WORDS -- ORAL LANGUAGE  
(in percent)

| <u>Grade</u> | <u>High Group</u> | <u>Random Group</u> | <u>Low Group</u> |
|--------------|-------------------|---------------------|------------------|
| 1            | 7.61              | 7.46                | 9.04             |
| 2            | 6.21              | 8.03                | 8.31             |
| 3            | 4.71              | 6.39                | 7.98             |
| 4            | 6.39              | 8.38                | 11.06            |
| 5            | 6.41              | 7.53                | 9.04             |
| 6            | 6.98              | 8.29                | 10.33            |
| 7            | 5.82              | 7.76                | 11.08            |
| 8            | 6.08              | 8.12                | 9.30             |
| 9            | 5.31              | 7.29                | 10.18            |
| 10           | 7.45              | 7.40                | 7.51             |
| 11           | 7.32              | 7.04                | 9.01             |
| 12           | 7.25              | 7.04                | 9.19             |

FIGURE 2

MAZE WORDS AS A PERCENTAGE OF TOTAL WORDS -- ORAL LANGUAGE  
(in percent)





Also of interest--and this is especially true for the Low group although it does pertain to the High and Random groups--is the fact that erratic upward and downward fluctuations occur during the middle years of schooling (approximately grades four through nine or ten). A less obvious feature of the data--but perhaps the most crucial of all--is that all groups end in grade twelve with virtually the identical percentages with which they began in grade one. In other words, all subjects end maintaining their initial proportion of maze words to total words despite the fact that increasing chronological age produces an increasing complexity in their language.

#### Average Number of Words per Maze -- Oral Language

The average number of words per maze is the subject's total number of maze words divided by his total number of mazes. For example, a total of 10 mazes and 20 maze words would produce an average of 2.00 words per maze.

In some respects, this particular measure has a tendency to understate the Low group's difficulties in overcoming these obstacles to fluency (mazes) since the Low group uses a lower number of words per communication unit than either the High or Random group. On the one hand, from a purely logical standpoint, one would expect the probability of becoming tangled in language to be disproportionately low if a subject uses communication units of relatively short length. On the other hand, even though the measure does not appear to be particularly crucial, the investigator has presented it as a matter of interest because it emphasizes the fact that the High group (except at grade one) invariably has a lower average number of words per maze than the Low group while simultaneously using a higher average number of words per communication unit.<sup>1</sup> (See Table 7 and Figure 3.)

#### Proficiency with Written Language

The findings on proficiency with written language are based upon the compositions written by each subject during the course of the investigation. These were obtained in the spring of each school year, and data will be presented for grades four through twelve.

To facilitate comparisons between the subjects' oral and written language, the findings on similar measures will be presented side-by-side rather than having an extensive chapter on oral language followed by one on written language. In the case of mazes, however, no written language data are presented since mazes as such almost never occur in the subjects'

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<sup>1</sup> One problem in any research is to discover the appropriate method for measuring a given phenomenon. For this reason the investigator has frequently used a variety of statistical methods in studying any specific piece of data with the hope that the overall study will produce measures which are not only clearly defined but also readily usable.

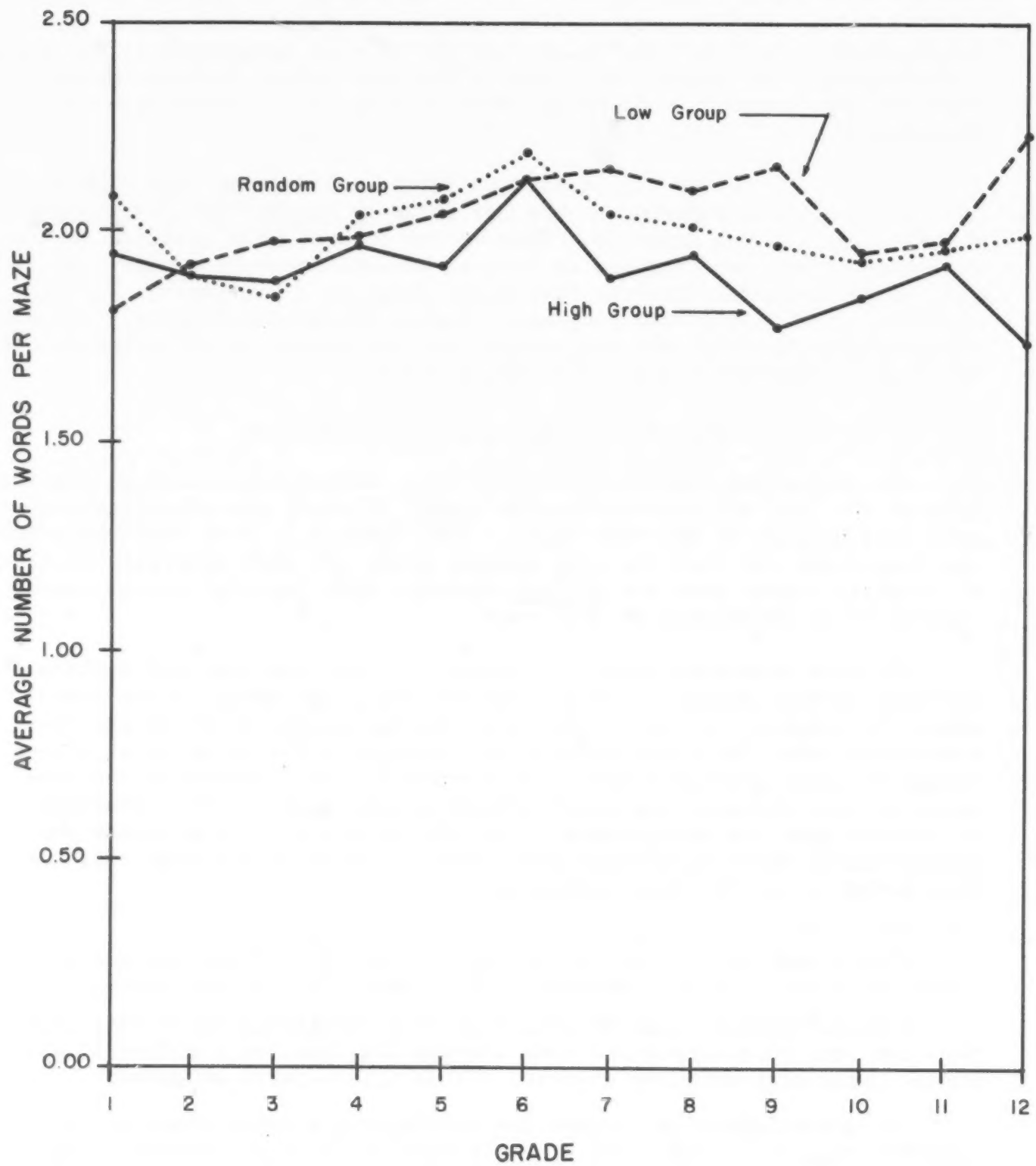
TABLE 7

AVERAGE NUMBER OF WORDS PER MAZE -- ORAL LANGUAGE  
(mean)

| Grade | High Group | Random Group | Low Group |
|-------|------------|--------------|-----------|
| 1     | 1.94       | 2.09         | 1.81      |
| 2     | 1.89       | 1.89         | 1.90      |
| 3     | 1.88       | 1.85         | 1.98      |
| 4     | 1.97       | 2.06         | 1.99      |
| 5     | 1.93       | 2.09         | 2.07      |
| 6     | 2.15       | 2.21         | 2.16      |
| 7     | 1.90       | 2.06         | 2.17      |
| 8     | 1.96       | 2.01         | 2.11      |
| 9     | 1.78       | 1.98         | 2.18      |
| 10    | 1.85       | 1.92         | 1.92      |
| 11    | 1.94       | 1.97         | 1.97      |
| 12    | 1.77       | 1.99         | 2.24      |

FIGURE 3

AVERAGE NUMBER OF WORDS PER MAZE -- ORAL LANGUAGE  
(mean)





written language.<sup>1</sup>

#### Average Number of Words per Communication Unit -- Written Language

In written language, the average number of words per communication unit does not indicate the neat, symmetrical pattern found in oral language. (See Table 8 and Figure 4.) For each group the curves are more erratic in the graphic presentation; and in reference to stages of growth, large upward trends are generally followed by what apparently is not merely a consolidation of growth but rather a downward shift, leading one to conclude that possibly each group tends on occasion to over-reach its abilities.<sup>2</sup>

Despite the relatively erratic patterns on the graph, the High group is still obviously superior to the Low group by roughly the same margin as was found in oral language. Thus we can predict with relative assurance that on written language as well as on oral language a High subject will be approximately four or five years ahead of a Low subject in this aspect of proficiency with language. Again, the Random (typical) subject falls between the High and Low groups, and the curves do not cross except for what is apparently a quirk at grade eleven.<sup>3</sup>

#### Comparison of Oral and Written Language

One comparison which is certainly very informative arises by placing data on the oral and written average number of words per communication unit side-by-side on the same table. (See Table 9.) From this comparison, the reader can see that the oral average words per unit generally tends to be slightly higher than the written average, with the high school years tending to be exceptions to this rule.

The most prominent feature, however, is that the oral and written averages usually appear to be similar for any given group in any given year. In other words, in reference to average number of words per communication unit, the subjects tend to speak and write in units of virtually the same average length. This pertains specifically to the subjects in this research and could be generalized only to other students of similar ages and backgrounds. The trained writer or the writer who intentionally takes particular pains with his written language will therefore probably not fit this conclusion.

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<sup>1</sup> Even a poor writer does not write as follows: "There was was a was there was a man." A poor speaker would frequently use such mazes, however.

<sup>2</sup> A consolidation would be indicated by a relatively horizontal line from one year to a subsequent year whereas the data for a number of different years show definite downward trends after spurts of growth.

<sup>3</sup> The investigator has termed the overlapping a quirk since it is apparent that it is explained by a downward shift by the Random group rather than an upward shift by the Low group.

TABLE 8

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT -- WRITTEN LANGUAGE

| Grade | Average Number of Words<br>per Communication Unit<br>(mean) |              |           | Relative Growth <sup>1</sup><br>(in percent) |              |           | Year-to-Year Velocity <sup>2</sup><br>(in percent) |              |           |
|-------|-------------------------------------------------------------|--------------|-----------|----------------------------------------------|--------------|-----------|----------------------------------------------------|--------------|-----------|
|       | High Group                                                  | Random Group | Low Group | High Group                                   | Random Group | Low Group | High Group                                         | Random Group | Low Group |
| 4     | 8.83                                                        | 8.02         | 6.01      | 66.54                                        | 60.44        | 45.29     | --                                                 | --           | --        |
| 5     | 9.52                                                        | 8.76         | 6.25      | 71.74                                        | 66.01        | 47.40     | + 5.20                                             | + 5.57       | + 2.11    |
| 6     | 10.23                                                       | 9.04         | 6.91      | 77.09                                        | 68.12        | 52.07     | + 5.35                                             | + 2.11       | + 4.67    |
| 7     | 10.83                                                       | 8.94         | 7.52      | 81.61                                        | 67.37        | 56.67     | + 4.52                                             | - 0.75       | + 4.60    |
| 8     | 11.24                                                       | 10.37        | 9.49      | 84.70                                        | 78.15        | 71.51     | + 3.09                                             | +10.78       | +14.84    |
| 9     | 11.09                                                       | 10.05        | 8.78      | 83.57                                        | 75.73        | 66.16     | - 1.13                                             | - 2.42       | - 5.35    |
| 10    | 12.59                                                       | 11.79        | 11.03     | 94.88                                        | 88.85        | 83.12     | +11.31                                             | +13.12       | +16.96    |
| 11    | 11.82                                                       | 10.69        | 11.21     | 89.07                                        | 80.56        | 84.48     | - 5.81                                             | - 8.29       | + 1.36    |
| 12    | 14.06                                                       | 13.27        | 11.24     | 105.95                                       | 100.00       | 84.70     | +16.88                                             | +19.44       | + 0.22    |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.

FIGURE 4

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT -- WRITTEN LANGUAGE  
(mean)

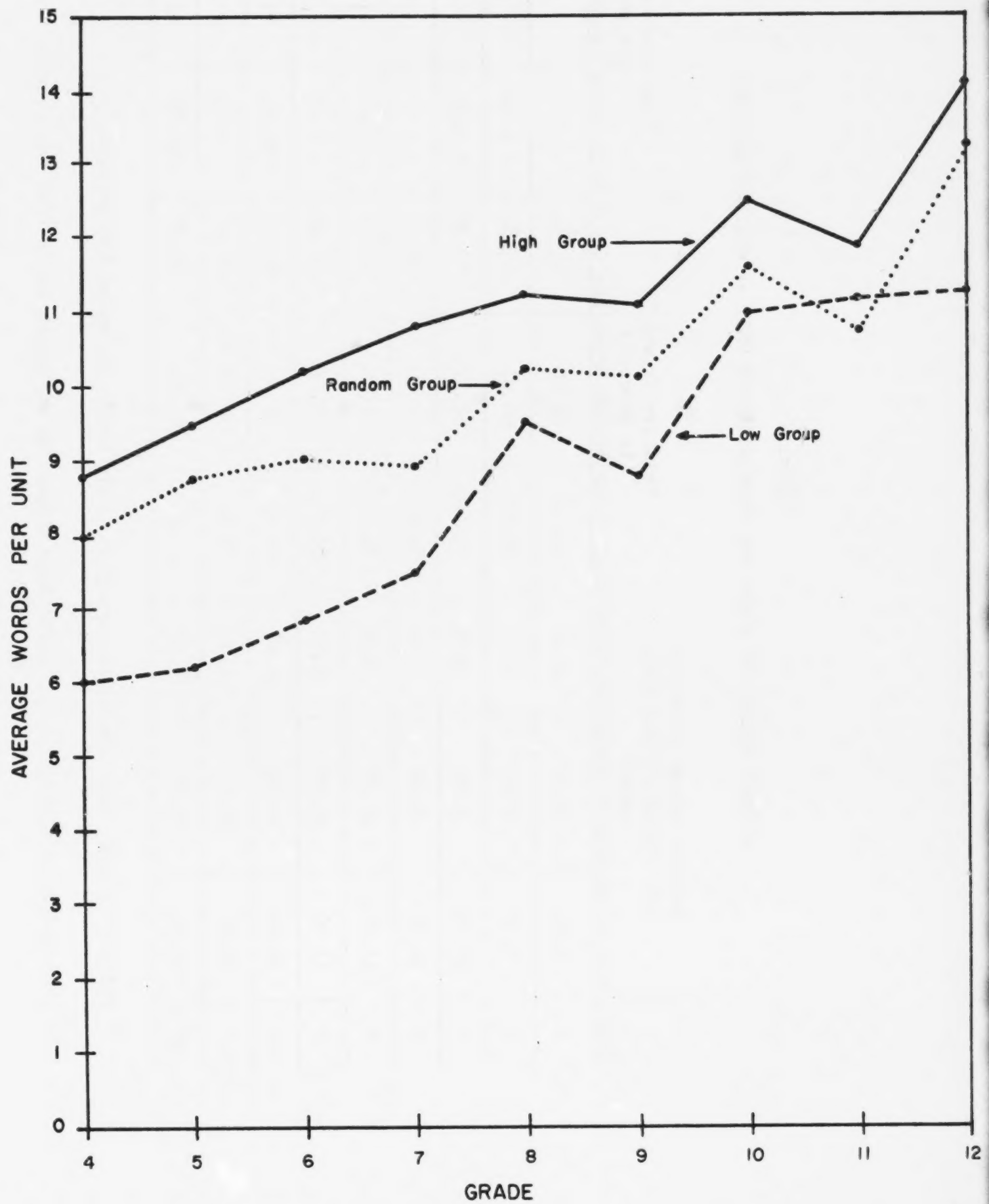


TABLE 9

AVERAGE NUMBER OF WORDS PER COMMUNICATION UNIT --  
COMPARISON OF ORAL AND WRITTEN LANGUAGE  
(mean)

| Grade | <u>High Group</u> |         | <u>Random Group</u> |         | <u>Low Group</u> |         |
|-------|-------------------|---------|---------------------|---------|------------------|---------|
|       | Oral              | Written | Oral                | Written | Oral             | Written |
| 1     | 7.91              | --      | 6.88                | --      | 5.91             | --      |
| 2     | 8.10              | --      | 7.56                | --      | 6.65             | --      |
| 3     | 8.38              | --      | 7.62                | --      | 7.08             | --      |
| 4     | 9.28              | 8.83    | 9.00                | 8.02    | 7.55             | 6.01    |
| 5     | 9.59              | 9.52    | 8.82                | 8.76    | 7.90             | 6.29    |
| 6     | 10.32             | 10.23   | 9.82                | 9.04    | 8.57             | 6.91    |
| 7     | 11.14             | 10.83   | 9.75                | 8.94    | 9.01             | 7.52    |
| 8     | 11.59             | 11.24   | 10.71               | 10.37   | 9.52             | 9.49    |
| 9     | 11.79             | 11.09   | 10.96               | 10.05   | 9.26             | 8.78    |
| 10    | 12.34             | 12.59   | 10.68               | 11.79   | 9.41             | 11.03   |
| 11    | 13.00             | 11.82   | 11.17               | 10.69   | 10.18            | 11.21   |
| 12    | 12.84             | 14.06   | 11.70               | 13.27   | 10.65            | 11.24   |



## PART VI: RESULTS OF THE INVESTIGATION --

### SPECIAL STUDY OF DEPENDENT CLAUSES

#### A Problem of Mathematics

In the research of Hunt, the procedure in computing the average number of clauses per communication unit was to use a combination of main clauses added to dependent clauses.<sup>1</sup> In the present research, however, the study of clauses concentrates exclusively on dependent clauses. Basically, the reason for this decision is one of mathematics and involves the following: When a given subject has 30 communication units and a total of 10 dependent clauses within those 30 units, should comparisons be made on the basis of the 10 dependent clauses or on the basis of 40 clauses (30 main clauses plus 10 dependent clauses)?

Logically, it would seem as if the High, Low, and Random groups should be compared on the basis of their dependent clauses--particularly since the focus is on elaboration and dependent clauses are obviously a key element in elaborated usage. But beyond this point is the fact that a combination of main clauses added to dependent clauses introduces into the subjects' growth rates a very pronounced element of distortion. For example, if one used in the computations a combination of main clauses added to dependent clauses, even a three-year-old child who speaks without using any dependent clauses whatsoever would still receive an average number of clauses per unit of 1.00. This occurs because each communication unit would be counted as a main clause. In other words, the subject would automatically be credited with a minimum average of 1.00. The mathematical calculation using Hunt's method would be as follows:

$$\begin{aligned}\text{Average Clauses} &= \frac{\text{Main Clauses} + \text{Subordinate Clauses}}{\text{Per Unit} \quad \text{Main Clauses}} \\ &= \frac{1.00 + 0.00}{1.00} = 1.00\end{aligned}$$

Now, if we take the Random group, we find that this group at grade twelve has 0.58 dependent clauses per unit. (See Table 10.) Or, if we use Hunt's method, the Random group would have an average of 1.58 (1.00 arising from main clauses plus 0.58 arising from dependent clauses). Then, if we used Hunt's method to compare our hypothetical three-year-old child to the Random group's twelfth grade average, we would have the following:

$$\frac{\text{Three-year-old child (minimum average ) } 1.00}{\text{Random twelfth grade oral mean } 1.58} = 63.29\%$$

(1.00 + 0.58 dependent clauses)

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<sup>1</sup> Hunt, op. cit., p. 45.

Thus, by virtue of following Hunt's mathematical model, we would be asserting that over 63 percent of growth in elaborated usage took place several years before the subject even entered kindergarten.<sup>1</sup>

Average Number of Dependent Clauses per Communication Unit -- Oral Language

For oral language the data on the average number of dependent clauses per communication unit indicate among the groups an even more striking disparity than found on previous measures. (See Table 10 and Figure 5.) If one examines the relative growth calculations, it can be seen that the High group reaches the 63 percent level in grade four whereas the Low group does not achieve this level until grade eleven.<sup>2</sup> However, one interesting phenomenon is the spurt of growth exhibited by the Low group in grade twelve, indicating that at the conclusion of high school the Low group tends to be approximately five years behind the High group. Again the Random (typical) subject falls between the High and Low groups, generally several years ahead of the Low group and several years behind the High group.

Another interesting facet of the data is that the Low group moves from 20 percent at grade one to 79 percent at grade twelve (a four-fold increase) whereas the High group's movement from 41 percent to 115 percent indicates only a three-fold increase. The Low group does in fact exhibit substantial growth--a growth which taken purely in percentage terms is rather striking. Thus one may hypothesize that the Low group's fundamental problem may arise from low socio-economic status and relatively poor early language environment.

Average Number of Dependent Clauses per Communication Unit --  
Written Language

In written language the data on the average number of dependent clauses per communication unit for the three groups are considerably more alike after elementary school than any of the measures presented previously (See Table 11 and Figure 6.) In grades four through eight the High group evidences an obvious superiority over both the Low and Random groups. But in grade nine the pattern grows less clear; and in grades ten, eleven, and twelve the Low group, despite beginning at a poor level, has rapidly forged ahead and essentially caught up to the High and Random groups.

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<sup>1</sup> Actually, if one carried Hunt's method to its logical conclusion, one would be asserting that 63 percent of growth takes place as soon as the child is able to communicate in a measurable unit.

<sup>2</sup> The reader should keep in mind that the growth rate percentages simply place the data in better perspective. The identical conclusion could be drawn from the averages themselves (the first column in Table 10) or from the graphic presentation of the averages (Figure 5). In other words, one could just as easily have said that the High group average of 0.37 at grade four was not achieved by the Low group until grade eleven (0.36).

TABLE 10

AVERAGE NUMBER OF DEPENDENT CLAUSES PER COMMUNICATION UNIT -- ORAL LANGUAGE

| Grade | Average Number of Dependent<br>Clauses per Unit<br>(mean) |           | Relative Growth <sup>1</sup><br>(in percent) |           | Year-to-Year Velocity <sup>2</sup><br>(in percent) |           |
|-------|-----------------------------------------------------------|-----------|----------------------------------------------|-----------|----------------------------------------------------|-----------|
|       | High Group                                                | Low Group | High Group                                   | Low Group | High Group                                         | Low Group |
| 1     | 0.24                                                      | 0.16      | 41.38                                        | 27.59     | --                                                 | --        |
| 2     | 0.25                                                      | 0.21      | 43.10                                        | 36.21     | + 1.72                                             | + 8.62    |
| 3     | 0.27                                                      | 0.22      | 46.55                                        | 37.93     | + 3.45                                             | + 1.72    |
| 4     | 0.37                                                      | 0.30      | 63.79                                        | 51.72     | +17.24                                             | + 3.45    |
| 5     | 0.37                                                      | 0.29      | 63.79                                        | 50.00     | 0.00                                               | + 8.62    |
| 6     | 0.41                                                      | 0.37      | 70.69                                        | 63.79     | + 6.90                                             | + 8.62    |
| 7     | 0.44                                                      | 0.35      | 75.86                                        | 60.34     | + 5.17                                             | + 1.73    |
| 8     | 0.45                                                      | 0.39      | 77.59                                        | 67.24     | + 1.73                                             | - 1.73    |
| 9     | 0.52                                                      | 0.43      | 89.66                                        | 74.14     | +12.07                                             | + 1.73    |
| 10    | 0.61                                                      | 0.48      | 105.17                                       | 82.76     | +15.51                                             | + 3.45    |
| 11    | 0.63                                                      | 0.52      | 108.62                                       | 89.66     | + 3.45                                             | + 5.17    |
| 12    | 0.67                                                      | 0.58      | 115.52                                       | 100.00    | + 6.90                                             | +17.24    |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.



FIGURE 5

AVERAGE NUMBER OF DEPENDENT CLAUSES PER COMMUNICATION UNIT --  
ORAL LANGUAGE  
(mean)

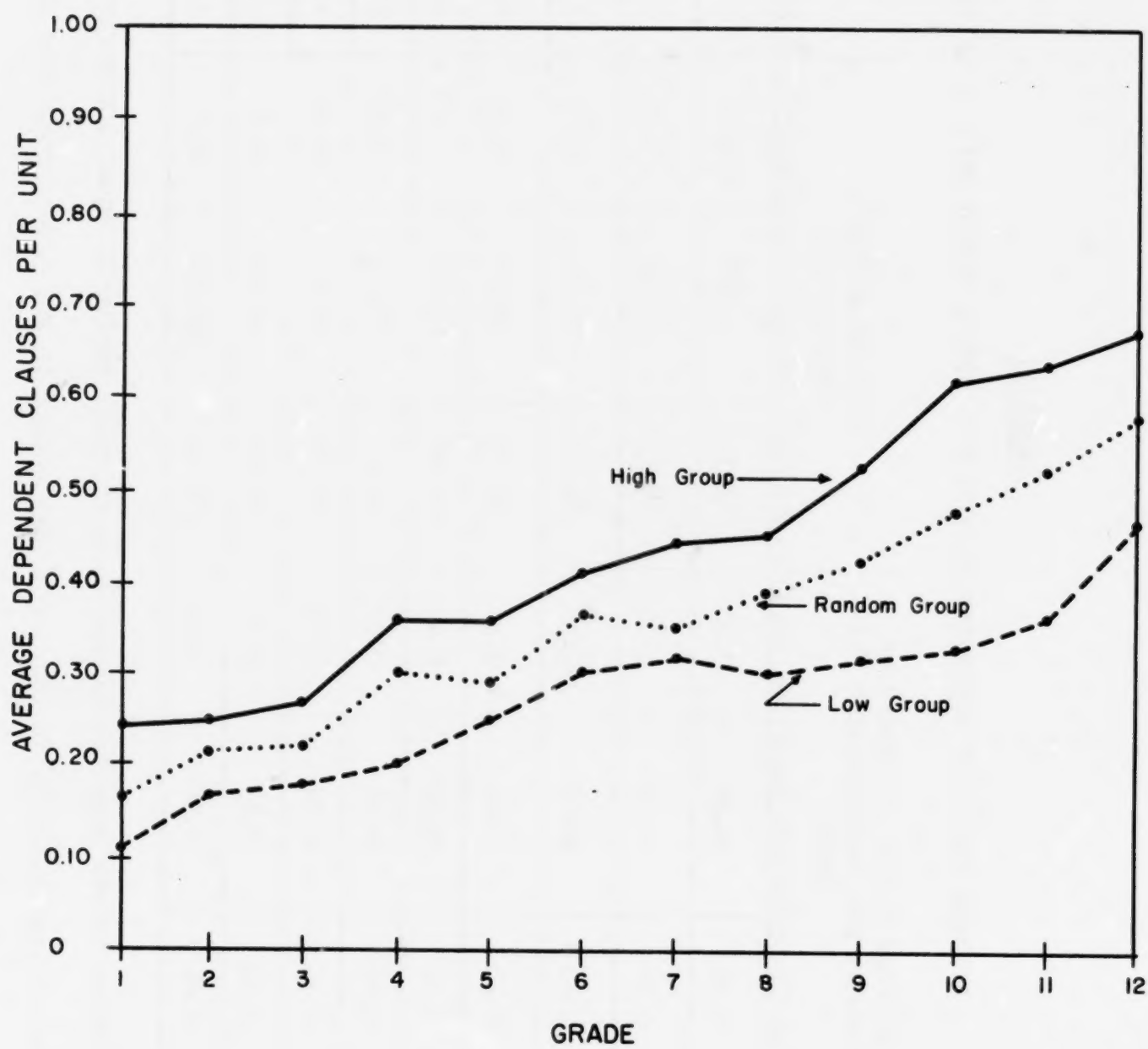




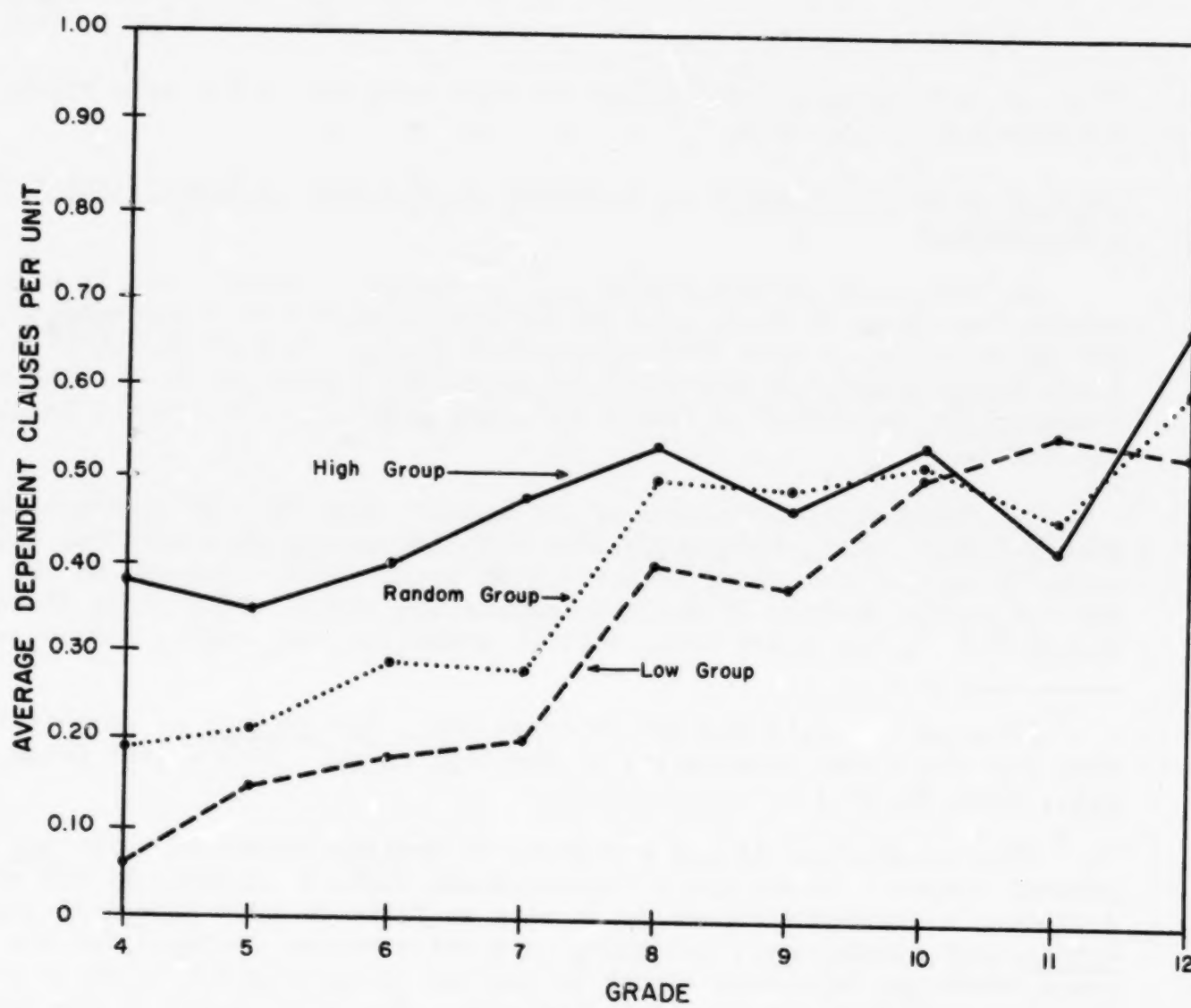
TABLE 11

AVERAGE NUMBER OF DEPENDENT CLAUSES PER COMMUNICATION UNIT -- WRITTEN LANGUAGE

| Grade | Average Number of Dependent<br>Clauses per Communication Unit<br>(mean) |              |           | Relative Growth <sup>1</sup><br>(in percent) |              |           | Year-to-Year Velocity <sup>2</sup><br>(in percent) |              |           |
|-------|-------------------------------------------------------------------------|--------------|-----------|----------------------------------------------|--------------|-----------|----------------------------------------------------|--------------|-----------|
|       | High Group                                                              | Random Group | Low Group | High Group                                   | Random Group | Low Group | High Group                                         | Random Group | Low Group |
| 4     | 0.38                                                                    | 0.19         | 0.06      | 63.33                                        | 31.67        | 10.00     | --                                                 | --           | --        |
| 5     | 0.35                                                                    | 0.21         | 0.14      | 58.33                                        | 35.00        | 23.33     | - 5.00                                             | + 3.33       | +13.33    |
| 6     | 0.40                                                                    | 0.29         | 0.18      | 66.67                                        | 48.33        | 30.00     | + 8.32                                             | +13.33       | + 6.67    |
| 7     | 0.48                                                                    | 0.28         | 0.20      | 80.00                                        | 46.67        | 33.33     | +13.33                                             | - 1.66       | + 3.33    |
| 8     | 0.54                                                                    | 0.50         | 0.40      | 90.00                                        | 83.33        | 66.67     | +10.00                                             | +36.66       | +33.34    |
| 9     | 0.46                                                                    | 0.47         | 0.37      | 76.67                                        | 78.33        | 61.67     | -13.33                                             | - 5.00       | - 5.00    |
| 10    | 0.53                                                                    | 0.52         | 0.51      | 88.33                                        | 86.67        | 85.00     | +11.66                                             | + 8.34       | +23.33    |
| 11    | 0.43                                                                    | 0.45         | 0.55      | 71.67                                        | 75.00        | 91.67     | -16.66                                             | -11.67       | + 6.67    |
| 12    | 0.66                                                                    | 0.60         | 0.52      | 110.00                                       | 100.00       | 86.67     | +38.33                                             | +25.00       | - 5.00    |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.

FIGURE 6  
AVERAGE NUMBER OF DEPENDENT CLAUSES PER COMMUNICATION UNIT --  
WRITTEN LANGUAGE  
(mean)



Regardless of the overall appearance, however, if one examines the data more carefully, it becomes clear that in grade eight the High group achieves an average of 0.54 dependent clauses per unit whereas the highest average ever achieved by the Low group is 0.55 in grade eleven (followed by a decline to 0.52 in grade twelve). In other words, the "catching up" done by the Low group is less real than it may appear at first glance and seems to be more a question of the High group's showing an erratic downward swing to 0.43 in grade eleven rather than a sudden spurt upward by the Low group.

A second factor of importance is that if one reads the actual compositions, the quality of writing produced by the Low group is obviously very poor in comparison to that of the High or Random group--not only because of poor spelling, punctuation, and usage but also because of the general lack of coherence evidenced in the writing of the Low group.<sup>1</sup> Also, superior writers often prefer a tighter way to coil their thoughts than dependent clauses permit. For example:

After he had finished the crossword puzzle, he went to bed.  
(tighter) Having finished the crossword puzzle, he went to bed.

Thus, to reach a valid conclusion one must look beyond the mere statistical presentation of the data.

#### Words in Dependent Clauses as a Percentage of Words in Communication Units-- Oral Language

One method of further examining the dependent clause data is to calculate the number of words used in dependent clauses as a percentage of the number of words used in communication units. In this way it is possible to ascertain the growth of the dependent clause portion of the unit (parallel to our method of determining the growth in the overall length of the unit).<sup>2</sup>

The first obvious feature of the data is that each group exhibits a steady upward trend, indicating that with increasing chronological age all subjects use an increasing proportion of their spoken language in the dependent clause portion of their communication units. (See Table 12 and Figure 7.) On the other hand, between grades one and eight, the subjects

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<sup>1</sup> Although the data are not reported here, the ratings of compositions show the very clear superiority of the High group. (See Walter Loban, op. cit., 1967, p. 96.)

<sup>2</sup> This computation is not a measure of average number of words per dependent clause. In any given communication unit, a subject may use no dependent clauses whatsoever or as many as three or four dependent clauses within that single unit, resulting in a mathematical tendency for the average words per dependent clause to decline in cases where there is more than one dependent clause within the unit. For this reason it was decided that the best measure would be words in dependent clauses as a percentage of words in units.

TABLE 12

WORDS IN DEPENDENT CLAUSES AS A PERCENTAGE OF WORDS IN  
COMMUNICATION UNITS -- ORAL LANGUAGE

| Grade | Percentage |              |           | Relative Growth <sup>1</sup><br>(in percent) |              |           | Year-to-Year Velocity <sup>2</sup><br>(in percent) |              |           |
|-------|------------|--------------|-----------|----------------------------------------------|--------------|-----------|----------------------------------------------------|--------------|-----------|
|       | High Group | Random Group | Low Group | High Group                                   | Random Group | Low Group | High Group                                         | Random Group | Low Group |
| 1     | 16.60      | 11.82        | 9.42      | 48.03                                        | 34.20        | 27.26     | --                                                 | --           | --        |
| 2     | 18.38      | 14.64        | 12.14     | 53.18                                        | 42.36        | 35.13     | + 5.15                                             | + 8.16       | + 7.87    |
| 3     | 18.50      | 14.86        | 12.07     | 53.53                                        | 43.00        | 34.92     | + 0.35                                             | + 0.64       | - 0.21    |
| 4     | 26.21      | 20.07        | 14.46     | 75.84                                        | 58.07        | 41.84     | +22.31                                             | +15.07       | + 6.92    |
| 5     | 23.98      | 19.62        | 17.53     | 69.39                                        | 56.77        | 50.72     | - 6.45                                             | - 1.30       | + 8.88    |
| 6     | 26.22      | 24.28        | 20.16     | 75.87                                        | 70.25        | 58.33     | + 6.48                                             | +13.48       | + 7.61    |
| 7     | 27.73      | 22.22        | 20.20     | 80.24                                        | 64.29        | 58.45     | + 4.37                                             | - 5.96       | + 0.12    |
| 8     | 26.94      | 23.34        | 18.52     | 77.95                                        | 67.53        | 53.59     | - 2.29                                             | + 3.24       | - 4.86    |
| 9     | 30.14      | 25.80        | 20.56     | 87.21                                        | 74.65        | 59.49     | + 9.26                                             | + 7.12       | + 5.90    |
| 10    | 35.64      | 29.69        | 22.26     | 103.12                                       | 85.91        | 64.41     | +15.91                                             | +11.26       | + 4.92    |
| 11    | 35.49      | 30.93        | 24.05     | 102.69                                       | 89.50        | 69.59     | - 0.43                                             | + 3.59       | + 5.18    |
| 12    | 36.34      | 34.56        | 28.78     | 105.15                                       | 100.00       | 83.28     | + 2.46                                             | +10.50       | +13.69    |

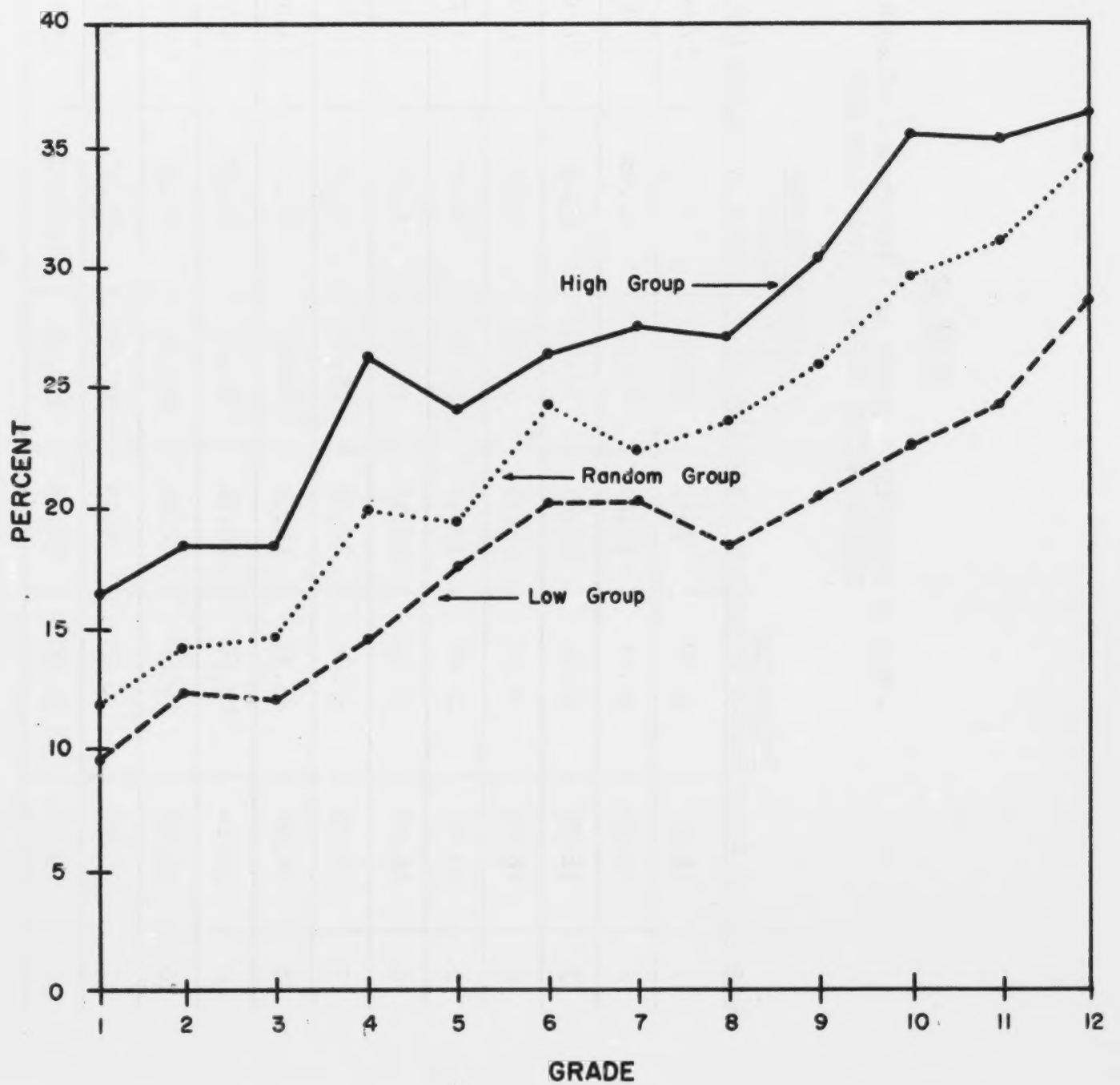
<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.

<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.



FIGURE 7

WORDS IN DEPENDENT CLAUSES AS A PERCENTAGE OF WORDS IN  
COMMUNICATION UNITS -- ORAL LANGUAGE



go through several stages which may be considered pauses or consolidations before achieving further growth.

Also of considerable interest is the fact that the High group exhibits approximately the same degree of superiority on this measure as it has on average number of words per total communication unit, remaining approximately four years above the Low group and two years above the Random group. In addition, the lines on the graph never cross, and there exists about the same magnitude of difference among the groups at grade twelve as at grade one.

#### Words in Dependent Clauses as a Percentage of Words in Communication Units-- Written Language

In written language the data on words in dependent clauses as a percentage of words in communication units contain the same peculiarities the investigator indicated previously in reference to the average number of written dependent clauses per unit. The data seem to discriminate clearly among the groups until grade nine; but following that year there is a criss-cross phenomenon on the graphs and an obvious catching-up process by the Low group. (See Table 13 and Figure 8.)

However, an examination of the written protocols shows the quality of the High group's compositions to be notably superior to that of the Low group in grades eight through twelve. Therefore, despite the statistical data, we can not conclude that the Low group has caught up to the High group. What, then, is happening? The explanation is that dependent clauses are not the only or necessarily always the best syntactic strategy for subordinating elements of thought. More sophisticated strategies include the following: appositives; nominative absolutes; noun, verb, and adjective clusters in cumulative sentences; gerunds, participles, and infinitives--simple or expanded. This is an interesting example of how writing differs from speaking.

The mathematics underlying Figure 8, therefore, are based upon a count in which the more mature syntactical strategies are not included. Thus, the sequence of events for written language is that in grades eight through twelve the High group uses a more sophisticated style in lieu of dependent clauses, making it appear as if the Low group is closing the earlier gap between the groups--as indeed it is, so far as dependent clauses are concerned.<sup>1</sup>

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<sup>1</sup> Later in this monograph data will be presented on a weighted index of elaboration which includes dependent clauses and other structures; for this measure of written language, the High group demonstrates a consistent superiority over the Random and Low groups.

TABLE 13

WORDS IN DEPENDENT CLAUSES AS A PERCENTAGE OF WORDS IN  
COMMUNICATION UNITS -- WRITTEN LANGUAGE

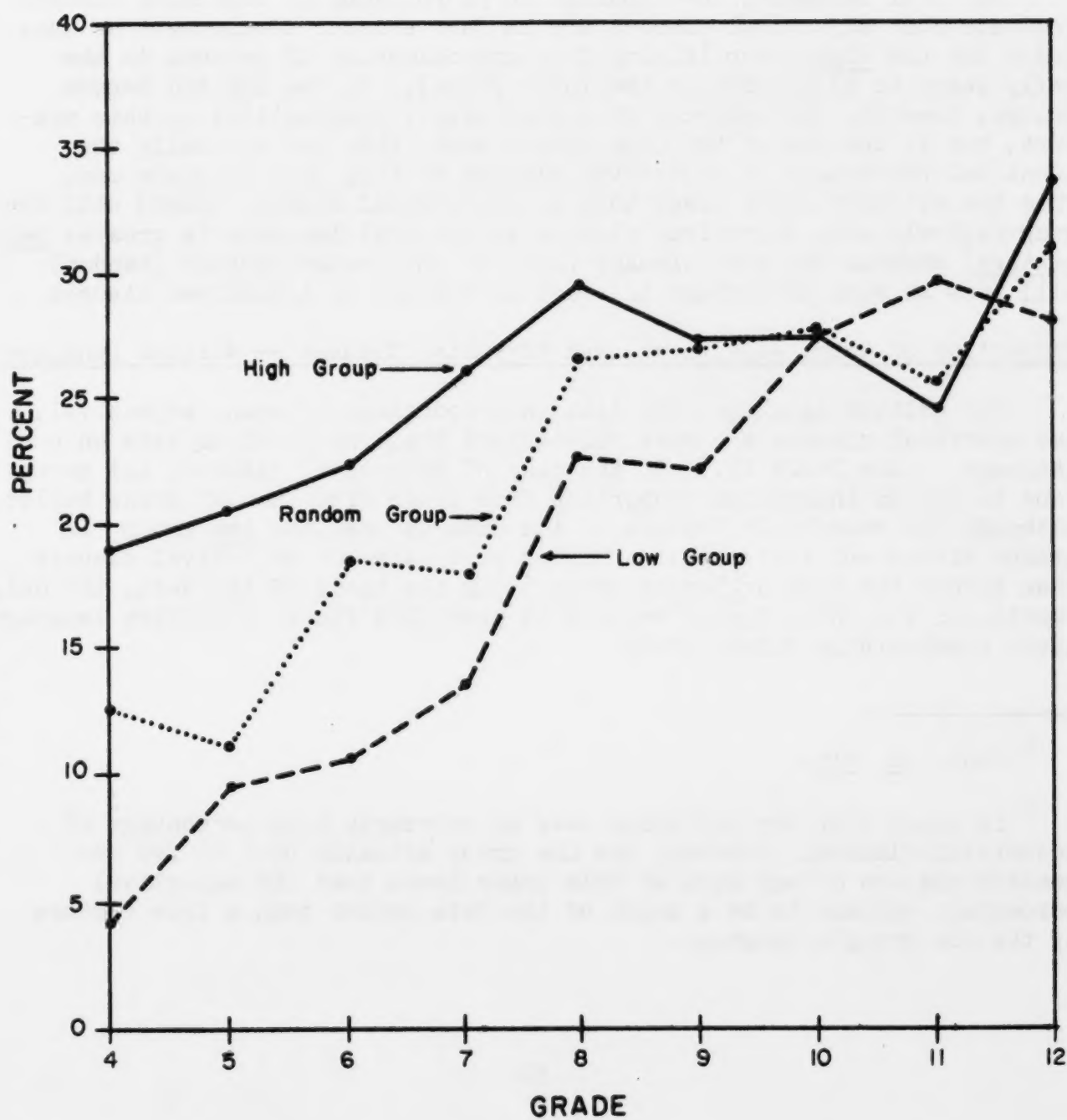
| Grade | Percentage |              |           | Relative Growth <sup>1</sup><br>(in percent) |              |           | Year-to-Year Velocity <sup>2</sup><br>(in percent) |              |           |
|-------|------------|--------------|-----------|----------------------------------------------|--------------|-----------|----------------------------------------------------|--------------|-----------|
|       | High Group | Random Group | Low Group | High Group                                   | Random Group | Low Group | High Group                                         | Random Group | Low Group |
| 4     | 19.02      | 12.68        | 4.04      | 61.26                                        | 40.84        | 13.01     | --                                                 | --           | --        |
| 5     | 20.38      | 11.02        | 9.40      | 65.64                                        | 35.49        | 30.27     | + 4.38                                             | - 5.35       | +17.26    |
| 6     | 22.16      | 18.55        | 10.63     | 71.37                                        | 59.74        | 34.24     | + 5.73                                             | +24.25       | + 3.97    |
| 7     | 26.03      | 17.95        | 13.47     | 83.83                                        | 57.81        | 43.38     | +12.46                                             | - 1.93       | + 9.14    |
| 8     | 29.71      | 26.30        | 22.38     | 95.68                                        | 84.70        | 72.08     | +11.85                                             | +26.89       | +28.70    |
| 9     | 26.86      | 26.67        | 21.62     | 85.51                                        | 85.89        | 69.63     | - 9.17                                             | + 1.19       | - 2.45    |
| 10    | 27.04      | 27.47        | 27.16     | 87.09                                        | 88.47        | 87.47     | + 0.58                                             | + 2.58       | +17.84    |
| 11    | 24.38      | 25.28        | 29.37     | 78.52                                        | 81.42        | 94.59     | - 8.57                                             | - 7.05       | + 7.12    |
| 12    | 33.82      | 31.05        | 27.58     | 108.92                                       | 100.00       | 88.82     | +30.40                                             | +18.58       | - 5.77    |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.

<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.

FIGURE 8

WORDS IN DEPENDENT CLAUSES AS A PERCENTAGE OF WORDS IN  
COMMUNICATION UNITS -- WRITTEN LANGUAGE





#### Proportion of Noun, Adjectival, and Adverbial Clauses -- Oral Language

To determine whether or not the groups exhibit any shift in the kinds of dependent clauses they use, each dependent clause was categorized as to noun, adjective, or adverb; the incidence was then tallied and converted to a percentage to show the proportions of noun, adjectival, and adverbial clauses actually used by the High, Low, and Random groups. (See Table 14 and Figures 9, 10, and 11.)

Of the three kinds of clauses, adjectival clauses are probably of the most interest since there has been speculation as to whether or not the use of adjectival clauses is a later development in language than the use of either noun or adverbial clauses.<sup>1</sup>

For oral language, the findings on proportions of dependent clauses indicate that adjectival clauses are in fact a later development of language for the High group (rising from approximately 22 percent in the early years to 33 percent in the later years). In the Low and Random groups, however, the subjects show some yearly fluctuations on this measure, but at the end of the high school years they use virtually the identical percentage of adjectival clauses as they used in grade one. Thus the evidence seems clear that an exceptional speaker (High) will use progressively more adjectival clauses in his oral language (a greater percentage) whereas the poor speaker (Low) or an average speaker (Random) will show no such percentage increase in the use of adjectival clauses.

#### Proportion of Noun, Adjectival, and Adverbial Clauses -- Written Language

For written language, the data on proportions of noun, adjectival, and adverbial clauses are more ill-defined than the previous data on oral language. (See Table 15.) In the case of adjectival clauses, all groups tend to use an increasing proportion from grade five through grade twelve although the remarkable feature of the data is that the Low group in grades eleven and twelve uses a higher percentage of adjectival clauses than either the High or Random group.<sup>2</sup> On the basis of the data, the only conclusion the investigator reaches is that this facet of written language needs considerable future study.

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<sup>1</sup> Hunt, op. cit.

<sup>2</sup> In grade four the Low group uses an extremely high percentage of adjectival clauses. However, the Low group actually uses so few dependent clauses of any kind at this grade level that the adjectival percentage appears to be a quirk of the data rather than a true feature of the Low group's language.

TABLE 14

PROPORTION OF NOUN, ADJECTIVAL, AND ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)<sup>1</sup>

| Grade | Noun Clauses |              |           | Adjectival Clauses |              |           | Adverbial Clauses |              |           |
|-------|--------------|--------------|-----------|--------------------|--------------|-----------|-------------------|--------------|-----------|
|       | High Group   | Random Group | Low Group | High Group         | Random Group | Low Group | High Group        | Random Group | Low Group |
| 1     | 45.84        | 41.48        | 33.56     | 23.23              | 26.18        | 19.09     | 30.93             | 32.34        | 47.35     |
| 2     | 54.91        | 44.75        | 35.07     | 20.50              | 25.21        | 18.86     | 24.59             | 30.04        | 46.07     |
| 3     | 53.40        | 43.05        | 46.79     | 22.65              | 27.83        | 21.55     | 23.95             | 29.12        | 31.66     |
| 4     | 45.15        | 49.63        | 50.35     | 20.84              | 19.90        | 21.41     | 34.01             | 30.47        | 28.24     |
| 5     | 45.74        | 48.19        | 51.72     | 26.90              | 21.91        | 19.98     | 27.36             | 29.90        | 28.30     |
| 6     | 47.38        | 47.06        | 52.06     | 22.53              | 21.10        | 22.36     | 30.09             | 31.84        | 25.58     |
| 7     | 38.98        | 41.12        | 53.02     | 30.03              | 30.15        | 21.27     | 30.99             | 28.73        | 25.71     |
| 8     | 36.52        | 37.14        | 29.79     | 35.30              | 34.24        | 31.05     | 28.18             | 28.62        | 39.16     |
| 9     | 37.11        | 43.70        | 49.32     | 38.30              | 30.85        | 21.37     | 24.59             | 25.45        | 29.31     |
| 10    | 43.35        | 44.54        | 47.74     | 30.20              | 25.50        | 20.43     | 26.45             | 29.96        | 31.83     |
| 11    | 40.66        | 46.67        | 44.67     | 33.76              | 24.06        | 27.00     | 25.58             | 29.27        | 28.33     |
| 12    | 43.34        | 50.27        | 45.25     | 33.05              | 24.69        | 20.73     | 23.61             | 25.04        | 34.02     |

<sup>1</sup> Noun + adjectival + adverbial add up to 100.00 percent in all cases (on a year-by-year basis for each group).

**FIGURE 9**

**PROPORTION OF NOUN, ADJECTIVAL, AND ADVERBIAL CLAUSES  
HIGH GROUP -- ORAL LANGUAGE**

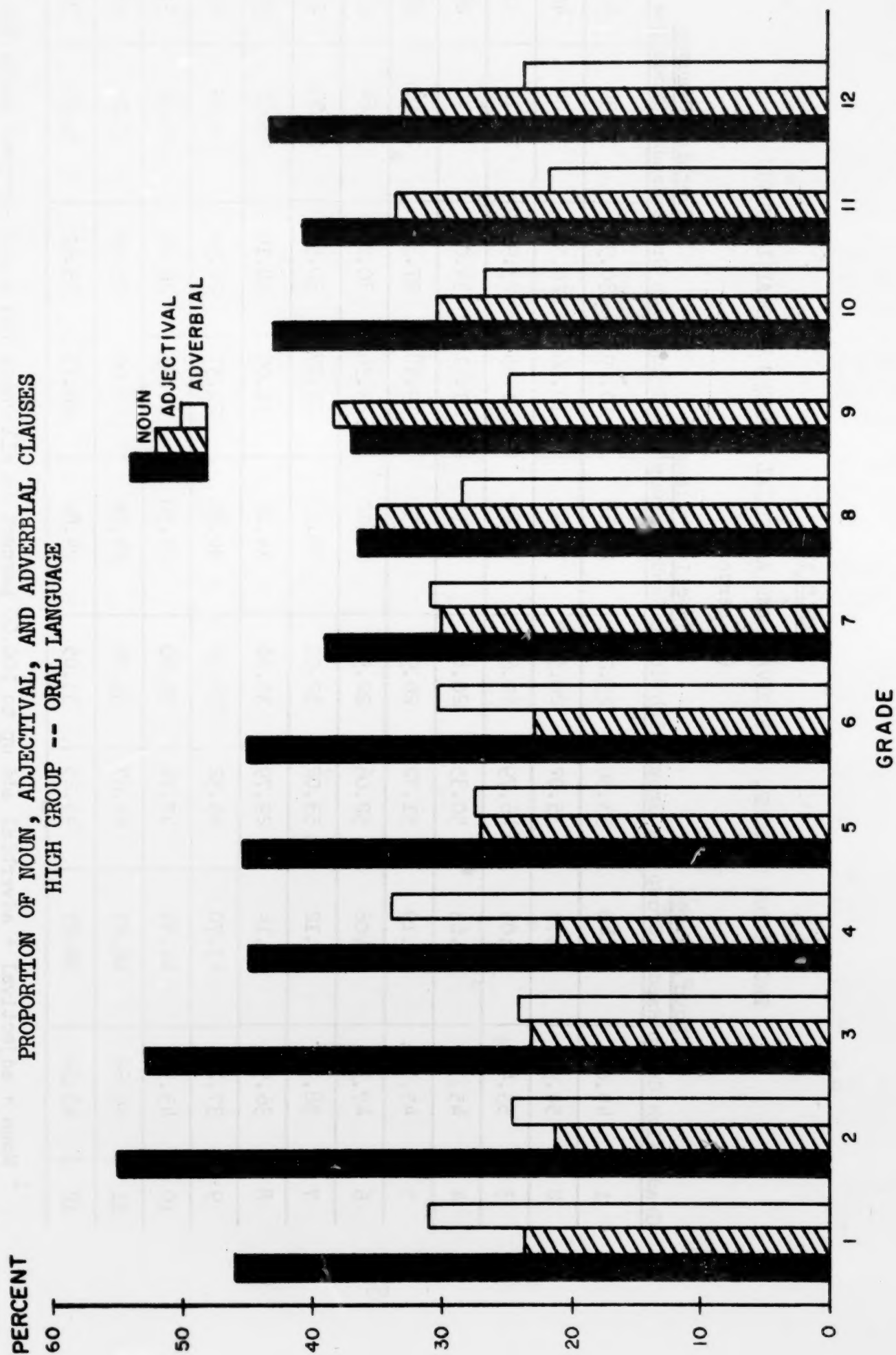
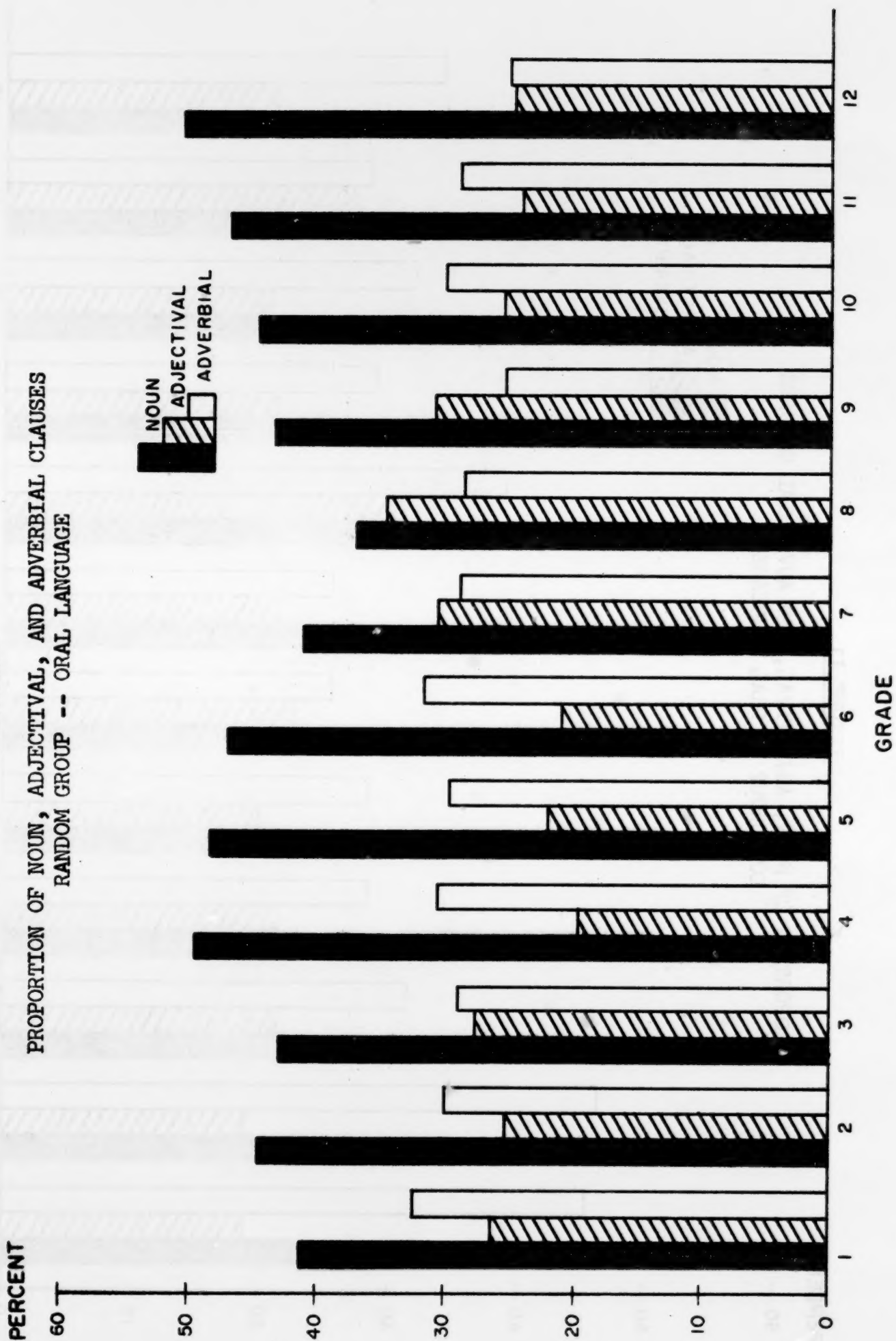


FIGURE 10





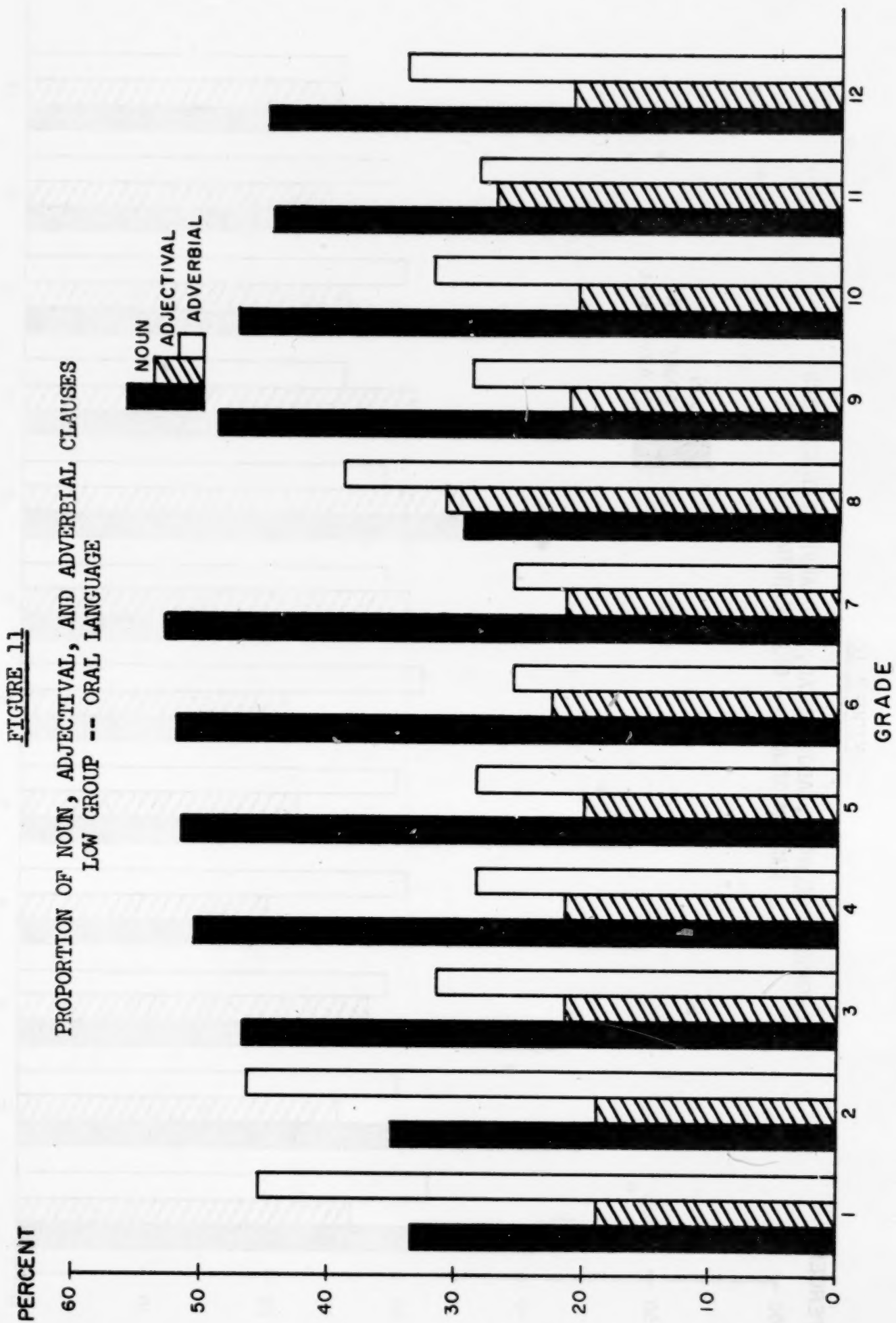


TABLE 15

PROPORTION OF NOUN, ADJECTIVAL, AND ADVERBIAL CLAUSES -- WRITTEN LANGUAGE  
(in percent)<sup>1</sup>

| Grade | Noun Clauses |              |           | Adjectival Clauses |              |           | Adverbial Clauses |              |           |
|-------|--------------|--------------|-----------|--------------------|--------------|-----------|-------------------|--------------|-----------|
|       | High Group   | Random Group | Low Group | High Group         | Random Group | Low Group | High Group        | Random Group | Low Group |
| 4     | 37.32        | 40.78        | 38.33     | 31.45              | 25.79        | 46.67     | 31.23             | 33.43        | 15.00     |
| 5     | 24.93        | 28.69        | 42.81     | 25.22              | 14.26        | 19.28     | 49.86             | 57.05        | 37.91     |
| 6     | 34.37        | 44.60        | 39.06     | 15.86              | 16.32        | 35.42     | 49.77             | 39.08        | 25.52     |
| 7     | 27.68        | 26.63        | 38.12     | 23.65              | 18.77        | 12.80     | 48.67             | 54.60        | 49.08     |
| 8     | 37.47        | 37.39        | 31.16     | 26.13              | 21.60        | 23.70     | 36.40             | 41.00        | 45.14     |
| 9     | 37.04        | 32.40        | 37.57     | 20.49              | 27.89        | 24.56     | 42.47             | 39.70        | 37.87     |
| 10    | 34.59        | 31.15        | 32.21     | 30.91              | 34.22        | 27.91     | 34.50             | 34.63        | 39.88     |
| 11    | 36.40        | 33.95        | 35.06     | 31.86              | 39.19        | 40.14     | 31.74             | 26.86        | 24.80     |
| 12    | 33.71        | 29.58        | 29.65     | 31.46              | 33.91        | 37.75     | 34.83             | 36.51        | 32.60     |

<sup>1</sup> Noun + adjectival + adverbial add up to 100.00 percent in all cases (on a year-by-year basis for each group).

### Relative Growth and Velocity of Noun, Adjectival, and Adverbial Clauses-- Oral Language

In Table 10 (presented earlier) data on the average number of dependent clauses per communication unit (oral language) indicated a substantial growth in the use of dependent clauses by the High, Low, and Random groups. The growth rates on this data (as distinguished from percentage proportions which treat each year as 100 percent and therefore do not indicate growth) have been calculated for noun, adjectival, and adverbial clauses as have the year-to-year velocities on these same data. (See Tables 16 and 17 and Figures 12, 13, and 14.)<sup>1</sup>

In examining the growth data, the most striking feature is the High group's huge growth in the use of adjectival clauses (35 percent in grade one to 154 percent in grade twelve) and the fact that the Low group's highest total is in adverbial clauses (101 percent in grade twelve).

Stages and velocity of growth are seen most clearly in the year-to-year velocities calculated for each group. (See Table 17.) This computation is simply a subtraction showing the difference between the growth rates of any group from one year to the next.<sup>2</sup> From this calculation, one can see that the High group's growth in adjectival clauses is centered mainly in junior high school and in grade eleven. The reader is invited to make other visual comparisons of the velocity figures such as grade eight being a year in which all groups show a large increase in the use of adjectives or grade twelve indicating the Low group's large increase in adverbs.

### Functions of Noun Clauses -- Oral Language

In previous data on the subjects' use of dependent clauses, the High group showed an obvious superiority over both the Random and Low groups, indicating that in oral language the High group's development is approximately two years above the Random group and four-to-five years above the Low group.

The purpose in the present analysis is to focus on the functions of noun clauses, keeping total noun clauses per group per year equal to 100 percent in order to discover whether or not any group exhibits substantial shifts in frequency of use of the various functions of noun clauses.<sup>3</sup>

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<sup>1</sup> Note that because of the inconclusive nature of the findings on written language, this breakdown of the data will be presented only for the subjects' oral language.

<sup>2</sup> For example, the High group's noun clauses for grade two (47.03) minus grade one (38.34) equals 8.69 which is the velocity between grades one and two.

<sup>3</sup> In subsequent sections of this chapter, data will also be presented on written language as well as on types of adverbial clauses, both oral and written.



TABLE 16

RELATIVE GROWTH RATE OF NOUN, ADJECTIVAL, AND ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)<sup>1</sup>

| Grade | Noun Clauses |              |           | Adjectival Clauses |              |           | Adverbial Clauses |              |           | Total      |              |           |
|-------|--------------|--------------|-----------|--------------------|--------------|-----------|-------------------|--------------|-----------|------------|--------------|-----------|
|       | High Group   | Random Group | Low Group | High Group         | Random Group | Low Group | High Group        | Random Group | Low Group | High Group | Random Group | Low Group |
| 1     | 38.34        | 26.42        | 18.18     | 35.69              | 27.66        | 13.73     | 50.70             | 30.77        | 33.59     | 40.73      | 27.76        | 20.86     |
| 2     | 47.03        | 35.11        | 24.44     | 38.92              | 38.92        | 27.45     | 43.45             | 39.93        | 44.37     | 44.10      | 37.20        | 30.12     |
| 3     | 49.70        | 34.41        | 26.76     | 44.41              | 42.35        | 25.39     | 46.27             | 44.86        | 43.66     | 47.52      | 38.99        | 30.64     |
| 4     | 62.57        | 53.88        | 32.67     | 51.68              | 44.41        | 30.20     | 77.68             | 57.25        | 45.56     | 63.57      | 52.32        | 35.29     |
| 5     | 61.87        | 48.77        | 45.29     | 66.58              | 46.47        | 32.05     | 67.11             | 59.15        | 49.08     | 64.37      | 50.76        | 42.88     |
| 6     | 67.19        | 61.52        | 54.57     | 65.41              | 59.51        | 40.49     | 85.21             | 74.44        | 56.34     | 71.22      | 64.26        | 51.50     |
| 7     | 57.59        | 45.99        | 54.92     | 90.12              | 73.92        | 45.78     | 99.30             | 76.55        | 60.35     | 76.13      | 60.61        | 53.94     |
| 8     | 53.98        | 49.01        | 34.41     | 110.50             | 97.46        | 64.04     | 93.87             | 77.25        | 77.25     | 78.17      | 68.19        | 52.49     |
| 9     | 65.94        | 62.56        | 47.62     | 135.90             | 102.06       | 48.25     | 95.28             | 71.83        | 70.42     | 90.91      | 74.80        | 53.49     |
| 10    | 90.72        | 73.44        | 52.59     | 125.60             | 83.05        | 48.25     | 114.08            | 105.42       | 74.44     | 105.28     | 83.78        | 56.96     |
| 11    | 90.37        | 84.12        | 56.90     | 146.40             | 90.12        | 67.26     | 113.38            | 100.70       | 70.42     | 110.26     | 89.74        | 62.92     |
| 12    | 97.32        | 100.00       | 76.47     | 154.22             | 100.00       | 65.41     | 118.10            | 100.00       | 101.20    | 116.86     | 100.00       | 79.78     |

<sup>1</sup> Using the Random group at grade twelve to equal 100 percent.



TABLE 17

YEAR-TO-YEAR VELOCITY OF RELATIVE GROWTH RATES FOR NOUN, ADJECTIVAL,  
AND ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)<sup>1</sup>

| Grade                                    | High Group |            | Random Group |            | Low Group |            |
|------------------------------------------|------------|------------|--------------|------------|-----------|------------|
|                                          | Noun       | Adjectival | Noun         | Adjectival | Noun      | Adjectival |
| 1                                        | --         | --         | --           | --         | --        | --         |
| 2                                        | + 8.69     | + 3.23     | + 8.69       | +11.26     | + 6.26    | +13.72     |
| 3                                        | + 2.67     | + 5.49     | - 0.70       | + 3.43     | + 2.32    | - 2.06     |
| 4                                        | +12.87     | + 7.27     | +19.47       | + 2.06     | + 5.91    | + 4.81     |
| 5                                        | - 0.70     | + 14.90    | - 5.11       | + 2.06     | +12.62    | + 1.85     |
| 6                                        | + 5.32     | - 1.17     | +12.75       | +13.04     | + 9.28    | + 8.44     |
| 7                                        | - 9.60     | + 24.71    | -15.53       | +14.41     | + 0.35    | + 5.29     |
| 8                                        | - 3.61     | + 20.38    | + 3.02       | +23.54     | -20.51    | +16.90     |
| 9                                        | +11.96     | + 25.40    | +13.55       | + 4.60     | +13.21    | - 6.83     |
| 10                                       | +24.78     | - 10.30    | +10.88       | -19.01     | + 4.97    | + 4.02     |
| 11                                       | - 0.35     | + 20.80    | +10.68       | + 7.07     | + 4.31    | - 4.02     |
| 12                                       | + 6.95     | + 7.82     | +15.88       | + 9.88     | +19.57    | +30.78     |
| Twelve-Year<br>Growth Total <sup>1</sup> | +58.98     | +118.53    | +73.58       | +72.34     | +58.29    | +67.61     |

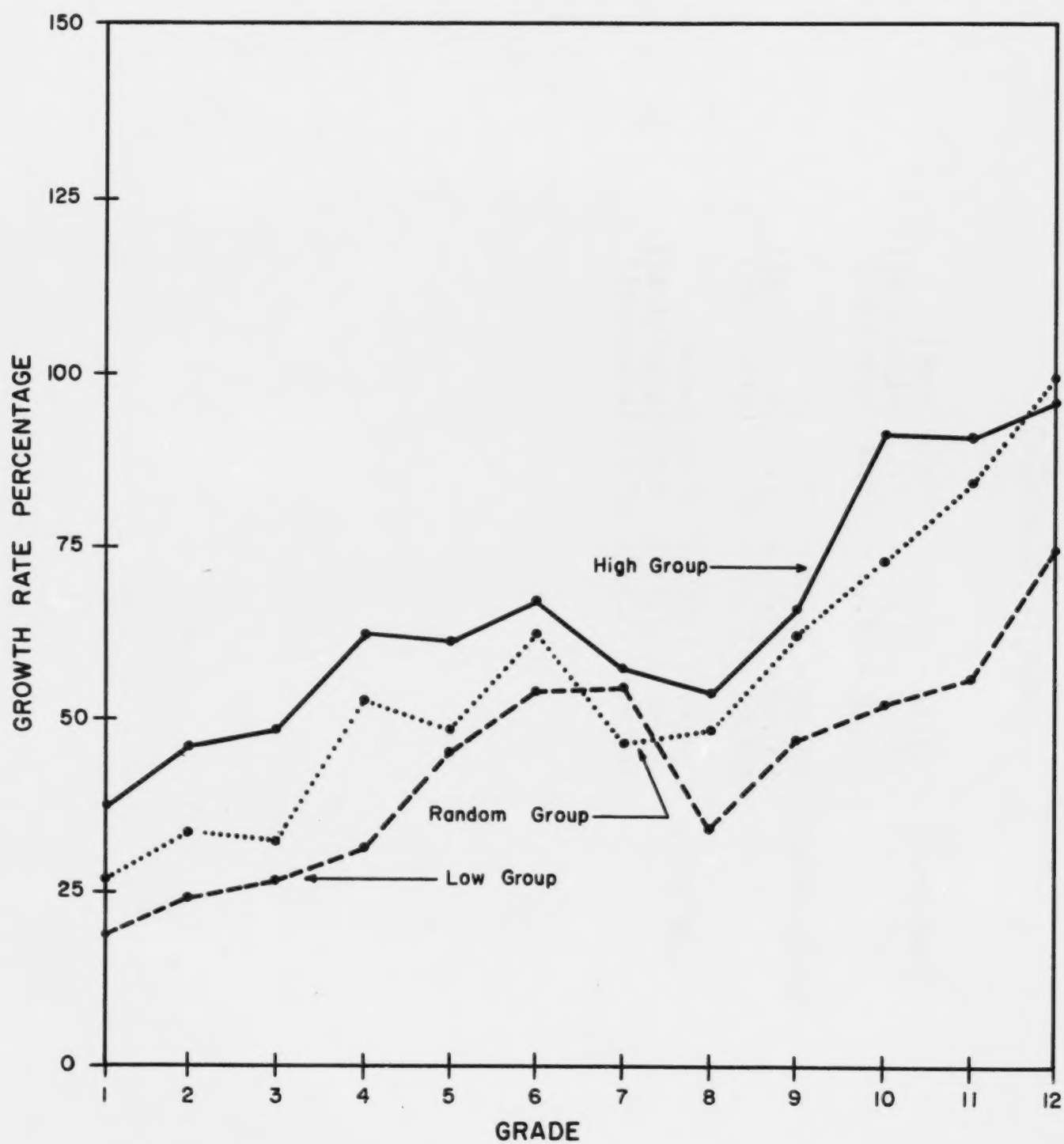
<sup>1</sup> Calculated directly from Table 16 -- Grade Twelve minus Grade One = Twelve-Year Growth Total.

TABLE 17 (Continued)

|              |                  |                     |
|--------------|------------------|---------------------|
| High Group   | 97.32 - 38.34 =  | 58.98 (noun)        |
|              | 154.22 - 35.69 = | 118.53 (adjectival) |
|              | 118.10 - 50.70 = | 67.40 (adverbial)   |
| Random Group | 100.00 - 26.42 = | 73.58 (noun)        |
|              | 100.00 - 27.66 = | 72.34 (adjectival)  |
|              | 100.00 - 30.77 = | 69.23 (adverbial)   |
| Low Group    | 76.47 - 18.18 =  | 58.29 (noun)        |
|              | 65.41 - 13.73 =  | 51.68 (adjectival)  |
|              | 101.20 - 33.59 = | 67.61 (adverbial)   |

FIGURE 12

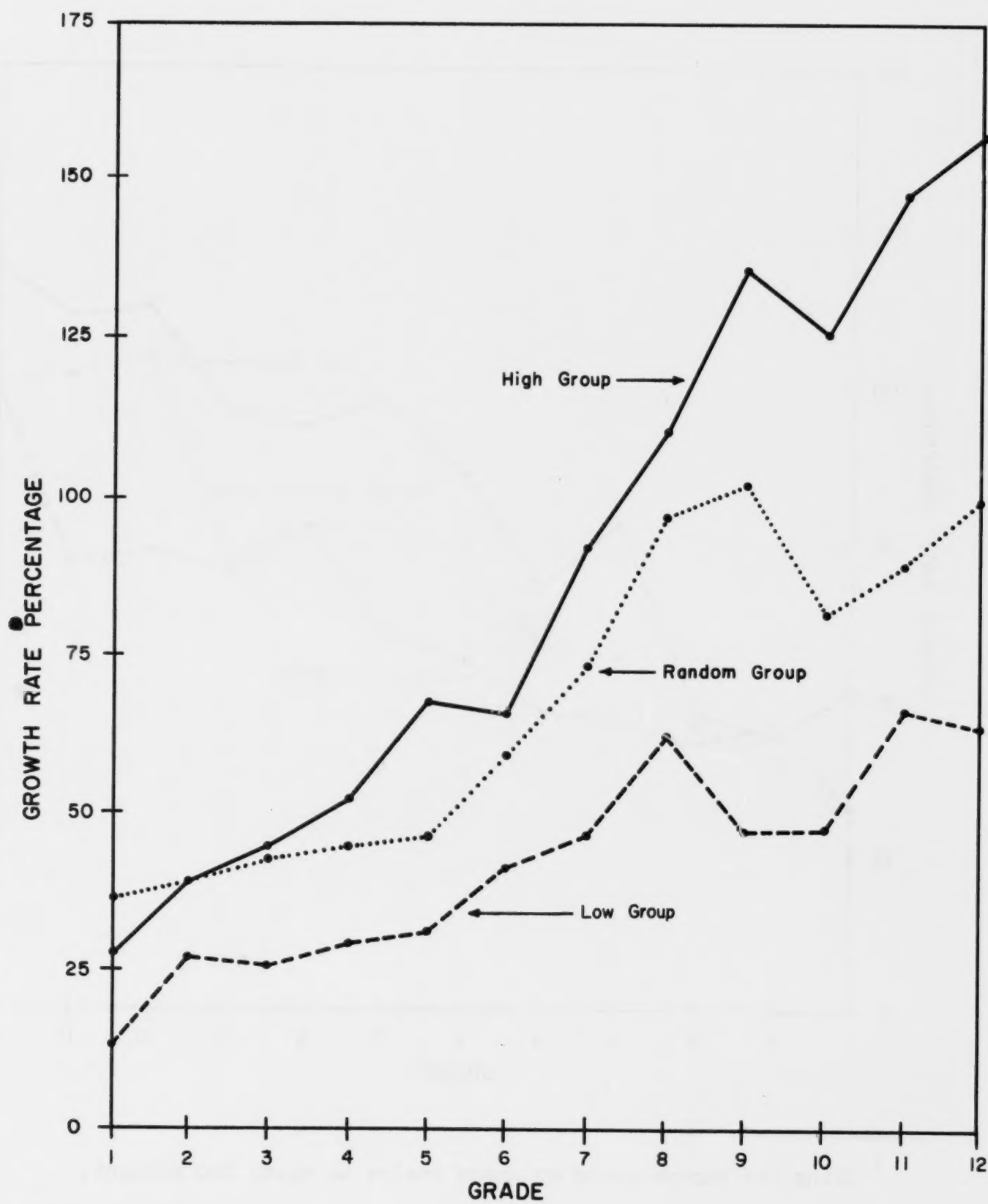
RELATIVE GROWTH RATE OF NOUN CLAUSES -- ORAL LANGUAGE  
(in percent)<sup>1</sup>



<sup>1</sup> Using the Random group at grade twelve to equal 100 percent.

FIGURE 13

RELATIVE GROWTH RATE OF ADJECTIVAL CLAUSES -- ORAL LANGUAGE  
(in percent)<sup>1</sup>

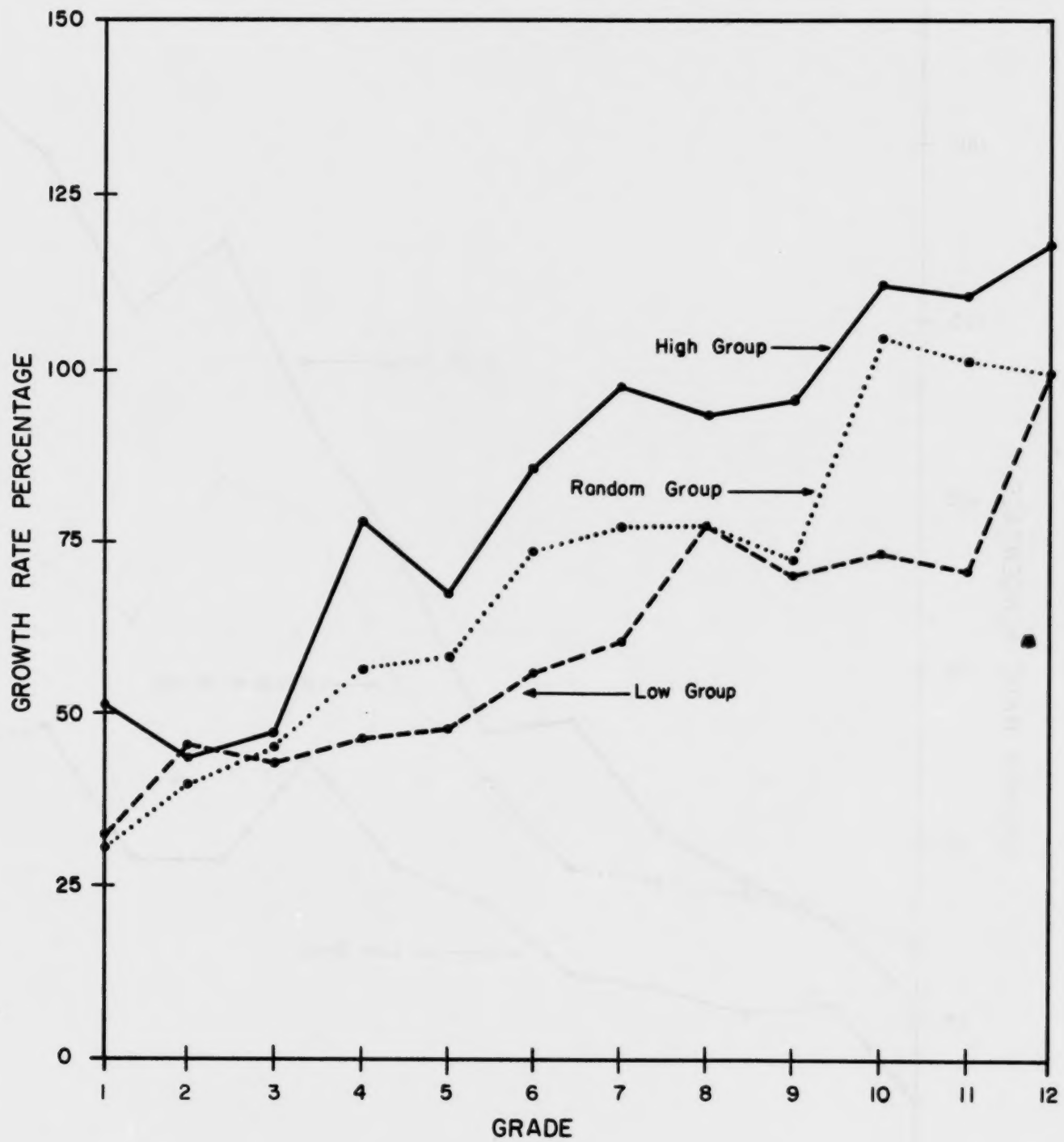


<sup>1</sup> Using the Random group at grade twelve to equal 100 percent.



FIGURE 14

RELATIVE GROWTH RATE OF ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)<sup>1</sup>



<sup>1</sup> Using the Random group at grade twelve to equal 100 percent.

Thus the types of questions we are asking would be similar to the following:

- (1) With increasing chronological age, does the High group use a greater proportion of appositives than either the Low or Random group?
- (2) Does the Low group concentrate almost exclusively on using noun clauses as direct objects and predicate nominatives, thus showing a poorer repertoire of noun clause functions than either the High or Random group?
- (3) Are there obvious gradations in the data, with the High group at one extreme, the Low group at the opposite extreme, and the Random group in the center?

The most obvious feature of the data is that, in oral language, all groups tend to concentrate their usage of noun clauses in either direct objects or predicate nominatives. (See Table 18, Part 1.) However, if one examines the column titled Remaining Percent, it becomes clear that an increase in chronological age does in fact cause each group to shift some usage to the less common categories of noun clauses, with a pronounced surge in this direction occurring at grade seven.

A less apparent feature of the data--although undoubtedly the most significant--is that when one examines the other categories of noun clauses, no group exhibits any remarkable shifts or trends which clearly distinguish it from any other group. (See Table 18, Parts 2, 3, and 4.) If one were to graph the various pieces of data, one would notice similar upward trends for all groups in categories such as object of preposition or object of infinitive. But at the same time the lines on the graph would cross frequently, indicating that no group demonstrates a consistent superiority in the use of any particular function of noun clause. Thus, the conclusion the investigator reaches is very similar to the one he reached in previous research into sentence patterns: it is not the type of pattern (or in this case the function of noun clause) that is significant but rather what the subject accomplishes within the clause in terms of elaborated usage and expanding his average number of words per communication unit.

#### Functions of Noun Clauses -- Written Language

The analysis of noun clauses in the subjects' written language is identical in all respects to the previous analysis of noun clauses in oral language. In many respects the conclusions are virtually identical except that for all groups the upward spurt in the Remaining Percent column occurs at grade eight in written language rather than at grade seven as in oral language. (See Table 19, Part 1.)

A second difference among the groups is that the High and Random groups tend to use a greater proportion of the less common functions of the noun clause than does the Low group. This difference, seen by

TABLE 18 (PART 1)

FUNCTIONS OF NOUN CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Direct Object |                 |              | Predicate Nominative |                 |              | Direct Object and<br>Predicate Nominative<br>(combined) |                 |              | Remaining Percent |                 |              |
|-------|---------------|-----------------|--------------|----------------------|-----------------|--------------|---------------------------------------------------------|-----------------|--------------|-------------------|-----------------|--------------|
|       | High<br>Group | Random<br>Group | Low<br>Group | High<br>Group        | Random<br>Group | Low<br>Group | High<br>Group                                           | Random<br>Group | Low<br>Group | High<br>Group     | Random<br>Group | Low<br>Group |
|       |               |                 |              |                      |                 |              |                                                         |                 |              |                   |                 |              |
| 1     | 62.26         | 80.30           | 89.36        | 33.02                | 12.12           | 8.51         | 95.28                                                   | 92.42           | 97.87        | 4.72              | 7.58            | 2.13         |
| 2     | 64.93         | 67.00           | 75.68        | 30.60                | 27.00           | 14.86        | 95.53                                                   | 94.00           | 90.54        | 4.47              | 6.00            | 9.46         |
| 3     | 58.90         | 64.29           | 54.32        | 33.56                | 32.65           | 38.27        | 92.46                                                   | 96.94           | 92.59        | 7.54              | 3.06            | 7.41         |
| 4     | 61.90         | 74.68           | 68.75        | 28.04                | 19.62           | 23.96        | 89.94                                                   | 94.30           | 92.71        | 10.06             | 5.70            | 7.29         |
| 5     | 69.52         | 74.10           | 85.40        | 19.25                | 17.99           | 8.03         | 88.77                                                   | 92.09           | 93.43        | 11.23             | 7.91            | 6.57         |
| 6     | 63.55         | 62.90           | 78.18        | 22.66                | 20.97           | 15.76        | 86.21                                                   | 83.87           | 93.94        | 13.79             | 16.13           | 6.06         |
| 7     | 58.62         | 69.78           | 69.28        | 16.67                | 17.99           | 16.26        | 75.29                                                   | 87.77           | 85.54        | 24.71             | 12.23           | 14.46        |
| 8     | 58.90         | 62.84           | 69.23        | 27.61                | 22.30           | 17.31        | 86.51                                                   | 85.14           | 86.54        | 13.49             | 14.86           | 13.46        |
| 9     | 60.30         | 61.38           | 61.11        | 21.11                | 19.58           | 21.53        | 81.41                                                   | 80.96           | 82.64        | 18.59             | 19.04           | 17.36        |
| 10    | 61.31         | 62.16           | 66.67        | 26.64                | 23.87           | 22.01        | 87.95                                                   | 86.03           | 88.68        | 12.05             | 13.97           | 11.32        |
| 11    | 61.17         | 60.24           | 58.14        | 18.68                | 20.47           | 25.00        | 79.85                                                   | 80.71           | 83.14        | 20.15             | 19.29           | 16.86        |
| 12    | 66.33         | 61.92           | 60.61        | 17.69                | 19.87           | 20.35        | 84.02                                                   | 81.79           | 80.96        | 15.98             | 18.21           | 19.04        |

TABLE 18 (PART 2)

FUNCTIONS OF NOUN CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Subject    |              | Appositive |            |              | Subsequent Appositive |            |              |           |
|-------|------------|--------------|------------|------------|--------------|-----------------------|------------|--------------|-----------|
|       | High Group | Random Group | Low Group  | High Group | Random Group | Low Group             | High Group | Random Group | Low Group |
| 1     | 0.00       | 1.52         | 0.00       | 0.00       | 3.03         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 2     | 2.24       | 2.00         | 1.35       | 0.75       | 1.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 3     | 0.00       | 0.00         | 0.00       | 0.00       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 4     | 1.06       | 0.00         | 0.00       | 0.53       | 0.00         | 0.00                  | 0.53       | 0.63         | 0.00      |
| 5     | 0.00       | 0.00         | 0.00       | 0.00       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 6     | 0.49       | 1.61         | 0.61       | 0.49       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 7     | 0.57       | 0.00         | 0.60       | 0.57       | 0.72         | 0.00                  | 0.57       | 0.00         | 0.00      |
| 8     | 0.00       | 0.00         | 0.00       | 0.00       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 9     | 0.50       | 1.06         | 0.00       | 0.50       | 0.53         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 10    | 1.09       | 0.00         | 0.63       | 0.36       | 0.45         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 11    | 0.37       | 0.39         | 0.00       | 2.20       | 0.39         | 0.00                  | 0.73       | 1.18         | 1.16      |
| 12    | 1.70       | 2.32         | 3.03       | 1.70       | 0.99         | 0.43                  | 3.06       | 1.32         | 1.30      |



TABLE 18 (PART 3)

FUNCTIONS OF NOUN CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Parenthetical |              |           | Object of Preposition |              |           | Object of Adjective |              |           |
|-------|---------------|--------------|-----------|-----------------------|--------------|-----------|---------------------|--------------|-----------|
|       | High Group    | Random Group | Low Group | High Group            | Random Group | Low Group | High Group          | Random Group | Low Group |
| 1     | 0.00          | 0.00         | 0.00      | 1.89                  | 1.52         | 0.00      | 0.00                | 0.00         | 0.00      |
| 2     | 0.75          | 0.00         | 1.35      | 0.75                  | 1.00         | 1.35      | 0.00                | 0.00         | 0.00      |
| 3     | 2.74          | 0.00         | 1.23      | 2.05                  | 2.04         | 1.23      | 0.68                | 0.00         | 0.00      |
| 4     | 0.53          | 0.00         | 1.04      | 3.70                  | 1.90         | 3.12      | 0.53                | 0.00         | 0.00      |
| 5     | 1.60          | 0.00         | 0.00      | 2.67                  | 1.44         | 2.19      | 0.00                | 0.00         | 0.00      |
| 6     | 0.49          | 0.00         | 0.00      | 6.40                  | 4.30         | 2.42      | 0.00                | 0.54         | 0.00      |
| 7     | 2.87          | 0.72         | 0.60      | 9.77                  | 5.76         | 4.82      | 1.15                | 0.72         | 0.60      |
| 8     | 1.84          | 0.62         | 0.00      | 3.68                  | 4.73         | 4.81      | 0.00                | 0.00         | 0.00      |
| 9     | 4.02          | 4.23         | 2.08      | 8.54                  | 6.35         | 3.47      | 0.50                | 0.00         | 1.39      |
| 10    | 0.00          | 1.35         | 0.00      | 5.84                  | 5.86         | 5.03      | 0.00                | 0.45         | 0.00      |
| 11    | 0.37          | 0.39         | 0.00      | 9.16                  | 4.72         | 5.81      | 1.83                | 0.00         | 0.00      |
| 12    | 0.00          | 0.33         | 0.00      | 5.44                  | 5.63         | 7.36      | 0.00                | 0.33         | 0.43      |

TABLE 18 (PART 4)

FUNCTIONS OF NOUN CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Object of Infinitive |              |           | Object of Participle |              |           | Object of Gerund |              |           |
|-------|----------------------|--------------|-----------|----------------------|--------------|-----------|------------------|--------------|-----------|
|       | High Group           | Random Group | Low Group | High Group           | Random Group | Low Group | High Group       | Random Group | Low Group |
| 1     | 1.89                 | 1.52         | 2.13      | 0.94                 | 0.00         | 0.00      | 0.00             | 0.00         | 0.00      |
| 2     | 0.00                 | 2.00         | 4.05      | 0.00                 | 0.00         | 0.00      | 0.00             | 0.00         | 0.00      |
| 3     | 1.37                 | 0.00         | 3.70      | 0.68                 | 1.02         | 1.23      | 0.00             | 0.00         | 0.00      |
| 4     | 1.59                 | 2.53         | 3.12      | 1.06                 | 0.00         | 0.00      | 0.00             | 0.63         | 0.00      |
| 5     | 4.28                 | 5.04         | 4.38      | 2.14                 | 1.44         | 0.00      | 0.53             | 0.00         | 0.00      |
| 6     | 5.42                 | 8.60         | 2.42      | 0.00                 | 0.54         | 0.00      | 0.49             | 0.00         | 0.00      |
| 7     | 6.90                 | 3.60         | 6.63      | 1.15                 | 0.00         | 0.00      | 0.57             | 0.00         | 0.00      |
| 8     | 7.98                 | 8.78         | 8.65      | 0.00                 | 0.68         | 0.00      | 0.00             | 0.00         | 0.00      |
| 9     | 2.51                 | 5.29         | 10.42     | 0.50                 | 0.53         | 0.00      | 1.51             | 1.06         | 0.00      |
| 10    | 3.65                 | 4.95         | 4.40      | 1.09                 | 0.45         | 0.63      | 0.00             | 0.45         | 0.63      |
| 11    | 2.93                 | 9.06         | 6.40      | 0.73                 | 1.97         | 1.74      | 1.10             | 1.18         | 1.16      |
| 12    | 2.72                 | 6.29         | 4.76      | 0.68                 | 0.66         | 1.30      | 0.68             | 0.33         | 0.43      |

High Group: grade four = 1 subject of infinitive clause (0.53%); grade seven = 1 repeated subject (0.57%); grade eleven = 1 repeated subject (0.37%) and 1 subject of a clause (0.37%).

Random Group: grade six = 1 rhetorical question (0.54%); grade seven = 1 repeated object (0.72%).

Low Group: grade two = 1 repeated subject (1.35%); grade six = 1 rhetorical question (0.61%); grade seven = 1 object of parenthetical (0.60%) and 1 repeated object (0.60%); grade eleven = 1 outer complement (0.58%).

TABLE 19 (PART 1)

FUNCTIONS OF NOUN CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | Direct Object |              |           | Predicate Nominative |              |           | Direct Object and Predicate Nominative (combined) |              |           | Remaining Percent |              |           |
|-------|---------------|--------------|-----------|----------------------|--------------|-----------|---------------------------------------------------|--------------|-----------|-------------------|--------------|-----------|
|       | High Group    | Random Group | Low Group | High Group           | Random Group | Low Group | High Group                                        | Random Group | Low Group | High Group        | Random Group | Low Group |
|       |               |              |           |                      |              |           |                                                   |              |           |                   |              |           |
| 4     | 84.44         | 76.85        | 50.00     | 10.56                | 23.15        | 50.00     | 95.00                                             | 100.00       | 100.00    | 5.00              | 0.00         | 0.00      |
| 5     | 91.67         | 78.00        | 81.79     | 0.00                 | 12.00        | 15.71     | 91.67                                             | 90.00        | 97.50     | 8.33              | 10.00        | 2.50      |
| 6     | 85.42         | 80.39        | 70.00     | 8.33                 | 11.84        | 30.00     | 93.75                                             | 92.23        | 100.00    | 6.25              | 7.77         | 0.00      |
| 7     | 90.67         | 84.17        | 56.25     | 2.00                 | 10.00        | 31.25     | 92.67                                             | 94.17        | 87.50     | 7.33              | 5.83         | 12.50     |
| 8     | 70.83         | 74.56        | 74.22     | 10.70                | 7.14         | 18.75     | 81.53                                             | 81.70        | 92.97     | 18.47             | 18.30        | 7.03      |
| 9     | 62.67         | 76.39        | 82.02     | 13.33                | 3.85         | 7.02      | 76.00                                             | 80.24        | 89.04     | 24.00             | 19.76        | 10.96     |
| 10    | 71.16         | 59.49        | 55.09     | 9.63                 | 24.92        | 35.18     | 80.79                                             | 84.41        | 90.27     | 19.21             | 15.59        | 9.73      |
| 11    | 77.95         | 68.35        | 64.33     | 12.55                | 10.30        | 16.99     | 90.50                                             | 78.65        | 81.34     | 9.50              | 21.35        | 18.66     |
| 12    | 59.71         | 63.36        | 61.31     | 9.13                 | 12.26        | 29.60     | 68.84                                             | 75.62        | 90.91     | 31.16             | 24.38        | 9.09      |

TABLE 19 (PART 2)

FUNCTIONS OF NOUN CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | Subject    |              | Appositive |            |              | Subsequent Appositive |            |              |           |
|-------|------------|--------------|------------|------------|--------------|-----------------------|------------|--------------|-----------|
|       | High Group | Random Group | Low Group  | High Group | Random Group | Low Group             | High Group | Random Group | Low Group |
| 4     | 0.00       | 0.00         | 0.00       | 0.00       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 5     | 0.00       | 0.00         | 0.00       | 0.00       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 6     | 0.00       | 0.00         | 0.00       | 0.00       | 0.00         | 0.00                  | 0.00       | 0.76         | 0.00      |
| 7     | 0.00       | 0.00         | 0.00       | 1.33       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 8     | 0.00       | 1.79         | 0.00       | 2.69       | 1.19         | 0.78                  | 0.00       | 0.00         | 0.00      |
| 9     | 0.00       | 2.62         | 5.26       | 0.49       | 0.00         | 0.00                  | 0.00       | 0.00         | 0.00      |
| 10    | 0.49       | 5.31         | 1.15       | 3.91       | 0.78         | 0.77                  | 0.00       | 1.17         | 0.00      |
| 11    | 0.76       | 0.81         | 0.43       | 1.01       | 1.21         | 0.48                  | 0.00       | 3.09         | 0.00      |
| 12    | 5.24       | 0.00         | 0.00       | 2.06       | 0.45         | 0.00                  | 0.71       | 0.00         | 0.00      |



TABLE 19 (PART 3)

FUNCTIONS OF NOUN CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | Parenthetical |              |           | Object of Preposition |              |           | Object of Adjective |              |           |
|-------|---------------|--------------|-----------|-----------------------|--------------|-----------|---------------------|--------------|-----------|
|       | High Group    | Random Group | Low Group | High Group            | Random Group | Low Group | High Group          | Random Group | Low Group |
| 4     | 0.00          | 0.00         | 0.00      | 0.00                  | 0.00         | 0.00      | 5.00                | 0.00         | 0.00      |
| 5     | 0.00          | 0.00         | 0.00      | 0.00                  | 5.00         | 0.00      | 6.25                | 5.00         | 0.00      |
| 6     | 0.00          | 0.00         | 0.00      | 0.00                  | 1.75         | 0.00      | 0.00                | 0.00         | 0.00      |
| 7     | 0.00          | 0.00         | 0.00      | 2.33                  | 0.00         | 0.00      | 0.00                | 0.00         | 0.00      |
| 8     | 0.00          | 0.00         | 0.00      | 9.03                  | 5.93         | 0.00      | 1.88                | 0.00         | 0.00      |
| 9     | 0.69          | 0.00         | 0.00      | 4.89                  | 2.05         | 2.41      | 0.86                | 0.96         | 0.00      |
| 10    | 0.00          | 0.00         | 0.00      | 3.03                  | 3.01         | 1.43      | 1.02                | 0.39         | 0.00      |
| 11    | 0.76          | 0.00         | 0.00      | 4.20                  | 3.83         | 2.05      | 0.00                | 0.00         | 1.92      |
| 12    | 0.00          | 0.00         | 0.00      | 8.95                  | 5.68         | 1.89      | 2.35                | 2.11         | 0.00      |

TABLE 19 (PART 4)

FUNCTIONS OF NOUN CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | Object of Infinitive |              |           | Object of Participle |              |           | Object of Gerund |              |           |
|-------|----------------------|--------------|-----------|----------------------|--------------|-----------|------------------|--------------|-----------|
|       | High Group           | Random Group | Low Group | High Group           | Random Group | Low Group | High Group       | Random Group | Low Group |
| 4     | 0.00                 | 0.00         | 0.00      | 0.00                 | 0.00         | 0.00      | 0.00             | 0.00         | 0.00      |
| 5     | 0.00                 | 0.00         | 2.50      | 2.08                 | 0.00         | 0.00      | 0.00             | 0.00         | 0.00      |
| 6     | 0.00                 | 0.00         | 0.00      | 2.08                 | 0.00         | 0.00      | 4.17             | 5.26         | 0.00      |
| 7     | 3.67                 | 1.67         | 6.25      | 0.00                 | 4.17         | 0.00      | 0.00             | 0.00         | 6.25      |
| 8     | 3.63                 | 3.21         | 6.25      | 1.24                 | 6.18         | 0.00      | 0.00             | 0.00         | 0.00      |
| 9     | 11.78                | 8.97         | 3.29      | 2.01                 | 4.20         | 0.00      | 3.28             | 0.96         | 0.00      |
| 10    | 6.22                 | 2.97         | 6.38      | 4.00                 | 1.56         | 0.00      | 0.53             | 0.39         | 0.00      |
| 11    | 1.89                 | 9.59         | 11.61     | 0.38                 | 1.61         | 1.28      | 0.51             | 1.21         | 0.91      |
| 12    | 5.83                 | 9.67         | 6.80      | 3.50                 | 5.58         | 0.40      | 2.52             | 0.89         | 0.00      |

comparing the percentages in the Remaining Percent column, seems to indicate a tendency by the High and Random groups to use a greater proportion of appositives, objects of prepositions, objects of adjectives, and objects of participles than the Low group. However, the investigator does not feel that the findings are in any way crucial since the data do not show a clear difference between the High and Random groups and since the Low group on two occasions has a higher figure in the Remaining Percent column than the High group. Therefore, the findings appear largely negative rather than indicating positive differences.<sup>1</sup> The research of Hunt, the Peabody Group, and Bateman and Zidonis should be read for more complete coverage of written language.<sup>2</sup>

#### Types of Adverbial Clauses -- Oral Language

Adverbial clauses have been analyzed in the same manner as noun clauses, keeping total adverbial clauses per group per year equal to 100 percent in order to discover whether or not any group exhibits substantial shifts in frequency of use of the various types of adverbial clauses.

Time and cause are the two types of adverbial clauses used most frequently by every group, accounting for approximately 75 percent of all adverbial clauses. (See Table 20, Part 1.) However, when looking at the column titled Remaining Percent, we find something different from what was found in the case of noun clauses. With adverbial clauses there does not appear to be a specific grade in which the remaining percent figures indicate a sudden upward surge. Instead, the percentages are relatively stable, with approximately the same proportions appearing in the early years as in the later years, with only grades eleven and twelve showing marked upward movement.

In reference to the less common types of adverbial clauses, one feature of the data is that the percentages for the High and Random groups tend to concentrate in clauses of consequence and concession whereas for the Low group the concentration tends to be in clauses of purpose, manner, and place. (See Table 20, Parts 2 and 3.) However, these tendencies are not so clearly defined that the investigator would cite them as a major finding but rather as one of interest, possibly meriting further study.<sup>3</sup>

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<sup>1</sup> One difficulty which accounts for what appear to be periodic quirks in the Low group's percentages is that in the early years a number of these subjects were nearly incapable of writing. It was a strain for some subjects to produce even a few written communication units.

<sup>2</sup> Hunt, op. cit.

Roy C. O'Donnell, William J. Griffin, and Raymond C. Norris, Syntax of Kindergarten and Elementary School Children (Champaign, Illinois: National Council of Teachers of English, 1967).

Bateman and Zidonis, op. cit.

<sup>3</sup> The most commonly used adverbial clause other than time or cause is condition; however, these percentages are high for all groups.

TABLE 20 (PART 1)

TYPES OF ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Time          |              | Cause         |              | Time and Cause<br>(combined) |              | Remaining Percent |              |
|-------|---------------|--------------|---------------|--------------|------------------------------|--------------|-------------------|--------------|
|       | High<br>Group | Low<br>Group | High<br>Group | Low<br>Group | High<br>Group                | Low<br>Group | High<br>Group     | Low<br>Group |
| 1     | 21.74         | 23.68        | 50.72         | 48.84        | 72.46                        | 81.57        | 27.54             | 27.90        |
| 2     | 14.75         | 26.79        | 62.30         | 63.64        | 77.05                        | 83.93        | 22.95             | 15.15        |
| 3     | 23.88         | 26.98        | 43.28         | 38.46        | 67.16                        | 73.01        | 32.84             | 27.69        |
| 4     | 45.69         | 44.58        | 31.90         | 18.18        | 77.59                        | 73.50        | 22.41             | 9.09         |
| 5     | 31.00         | 40.96        | 43.00         | 21.92        | 74.00                        | 68.67        | 26.00             | 21.92        |
| 6     | 41.73         | 41.44        | 34.65         | 30.95        | 76.38                        | 81.08        | 23.62             | 29.76        |
| 7     | 33.78         | 40.35        | 40.54         | 24.44        | 74.32                        | 73.68        | 25.68             | 24.45        |
| 8     | 42.86         | 39.13        | 25.71         | 26.96        | 68.57                        | 70.43        | 31.43             | 24.34        |
| 9     | 47.89         | 47.66        | 27.46         | 28.57        | 75.35                        | 78.50        | 24.65             | 18.10        |
| 10    | 37.06         | 44.59        | 36.47         | 27.03        | 73.53                        | 77.07        | 26.47             | 22.52        |
| 11    | 28.40         | 29.33        | 40.83         | 18.10        | 69.23                        | 66.00        | 30.77             | 35.23        |
| 12    | 24.43         | 29.53        | 38.64         | 27.81        | 63.07                        | 64.43        | 36.93             | 33.78        |



TABLE 20 (PART 2)

TYPES OF ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Condition  |              | Consequence |           | Comparison |              | Concession |           |
|-------|------------|--------------|-------------|-----------|------------|--------------|------------|-----------|
|       | High Group | Random Group | High Group  | Low Group | High Group | Random Group | High Group | Low Group |
| 1     | 8.70       | 5.26         | 2.90        | 2.33      | 1.45       | 0.00         | 1.45       | 0.00      |
| 2     | 13.11      | 8.93         | 0.00        | 1.52      | 1.64       | 5.36         | 0.00       | 0.00      |
| 3     | 13.43      | 15.87        | 0.00        | 0.00      | 7.46       | 3.17         | 0.00       | 0.00      |
| 4     | 12.93      | 15.66        | 2.59        | 1.52      | 1.72       | 3.61         | 0.00       | 0.00      |
| 5     | 11.00      | 9.64         | 3.00        | 1.37      | 3.00       | 4.82         | 2.00       | 1.37      |
| 6     | 6.30       | 8.11         | 9.45        | 4.76      | 0.00       | 0.90         | 0.00       | 0.00      |
| 7     | 6.08       | 8.77         | 5.41        | 3.33      | 4.05       | 4.39         | 0.00       | 0.00      |
| 8     | 5.71       | 9.57         | 11.43       | 0.00      | 1.43       | 0.00         | 2.14       | 0.87      |
| 9     | 5.63       | 3.74         | 4.93        | 0.95      | 2.82       | 3.74         | 3.52       | 0.95      |
| 10    | 3.53       | 7.01         | 8.24        | 3.60      | 2.94       | 1.91         | 4.12       | 0.00      |
| 11    | 4.73       | 14.67        | 7.10        | 3.81      | 4.73       | 4.67         | 7.10       | 0.95      |
| 12    | 13.64      | 16.78        | 5.11        | 1.32      | 2.84       | 3.36         | 6.25       | 1.99      |

TABLE 20 (PART 3)

TYPES OF ADVERBIAL CLAUSES -- ORAL LANGUAGE  
(in percent)

| Grade | Purpose    |              |           | Manner     |              |           | Place      |              |           | Degree     |              |           |
|-------|------------|--------------|-----------|------------|--------------|-----------|------------|--------------|-----------|------------|--------------|-----------|
|       | High Group | Random Group | Low Group | High Group | Random Group | Low Group | High Group | Random Group | Low Group | High Group | Random Group | Low Group |
| 1     | 7.25       | 0.00         | 2.33      | 5.80       | 2.63         | 4.65      | 0.00       | 5.26         | 9.30      | 0.00       | 0.00         | 0.00      |
| 2     | 8.20       | 0.00         | 3.03      | 0.00       | 1.79         | 0.00      | 0.00       | 0.00         | 3.03      | 0.00       | 0.00         | 0.00      |
| 3     | 5.97       | 3.17         | 7.69      | 5.97       | 1.59         | 1.54      | 0.00       | 3.17         | 4.62      | 0.00       | 0.00         | 1.54      |
| 4     | 3.45       | 2.41         | 0.00      | 0.00       | 0.00         | 1.52      | 1.72       | 1.20         | 0.00      | 0.00       | 1.20         | 1.52      |
| 5     | 4.00       | 3.61         | 9.59      | 2.00       | 1.20         | 1.37      | 1.00       | 4.82         | 4.11      | 0.00       | 2.41         | 0.00      |
| 6     | 0.00       | 5.41         | 7.14      | 4.72       | 0.00         | 1.19      | 1.57       | 0.00         | 3.57      | 1.57       | 0.00         | 1.19      |
| 7     | 5.41       | 0.88         | 7.78      | 2.70       | 1.75         | 2.22      | 1.35       | 4.39         | 1.11      | 0.68       | 0.88         | 0.00      |
| 8     | 2.86       | 6.96         | 7.83      | 2.14       | 3.48         | 2.61      | 4.29       | 0.00         | 0.00      | 1.43       | 0.00         | 0.00      |
| 9     | 4.23       | 4.67         | 6.67      | 3.52       | 1.87         | 2.86      | 0.00       | 0.00         | 0.00      | 0.00       | 0.00         | 0.00      |
| 10    | 1.76       | 5.10         | 2.70      | 1.18       | 3.82         | 4.50      | 2.94       | 1.27         | 0.90      | 1.76       | 0.64         | 1.80      |
| 11    | 2.96       | 2.67         | 6.67      | 2.37       | 5.33         | 4.76      | 1.18       | 0.67         | 0.00      | 0.59       | 0.00         | 1.90      |
| 12    | 2.27       | 7.38         | 3.31      | 6.25       | 1.34         | 3.31      | 0.00       | 0.00         | 0.00      | 0.57       | 0.67         | 0.66      |

### Types of Adverbial Clauses -- Written Language

Adverbial clauses in written language were analyzed in the same manner as those in oral language, with total adverbial clauses per group per year equaling 100 percent.

Again, as in oral language, the predominant types of adverbial clauses in written language are clauses of time and cause. (See Table 21, Part 1.) However, the Remaining Percent column contains many more erratic fluctuations than were found in oral language, in all likelihood indicating that once a subject has begun to write a composition his language probably becomes less flexible than it would be if he were speaking. In other words, if the nature of the composition is such that time and cause are dominant features, this characteristic in turn precipitates high percentages in those categories whereas if the nature of the composition is more reflective, one would expect higher percentages in other categories.<sup>1</sup>

Other than clauses of time or cause, adverbial clauses of condition are those most commonly used by all groups whereas clauses of place appear the least common. A further feature of the written language data--one tending to be at variance with the oral data--is that there are no obvious differences among the groups with respect to clauses of consequence or concession (oral language showing higher percentages for the High and Random groups) and no obvious differences with respect to clauses of purpose, manner, and place (oral language showing higher percentages for the Low group). Therefore, the conclusion the investigator reaches once again is that it is not the type of adverbial clause which is of significance but rather what is accomplished within the clause (adverbial, noun, or adjectival) to elaborate one's expression and to increase one's average number of words per communication unit.

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<sup>1</sup> On occasion the Low group causes peculiar quirks in the data. The investigator has cited reasons for this fact in a previous footnote.

TABLE 21 (PART 1)

TYPES OF ADVERBIAL CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | Time          |              | Cause         |              | Time and Cause<br>(combined) |              | Remaining Percent |              |
|-------|---------------|--------------|---------------|--------------|------------------------------|--------------|-------------------|--------------|
|       | High<br>Group | Low<br>Group | High<br>Group | Low<br>Group | High<br>Group                | Low<br>Group | High<br>Group     | Low<br>Group |
| 4     | 65.80         | 62.50        | 13.16         | 0.00         | 78.96                        | 66.67        | 21.04             | 75.00        |
| 5     | 48.33         | 36.84        | 13.03         | 20.00        | 61.36                        | 53.51        | 38.64             | 40.00        |
| 6     | 54.02         | 72.45        | 16.53         | 0.00         | 70.55                        | 88.68        | 29.45             | 22.23        |
| 7     | 65.48         | 65.27        | 9.17          | 20.18        | 74.65                        | 75.60        | 25.35             | 28.94        |
| 8     | 69.84         | 67.03        | 7.20          | 27.37        | 77.04                        | 79.87        | 22.96             | 6.14         |
| 9     | 65.89         | 58.79        | 13.97         | 26.75        | 79.86                        | 76.07        | 20.14             | 20.40        |
| 10    | 50.55         | 40.07        | 17.22         | 45.34        | 67.77                        | 71.60        | 32.23             | 25.10        |
| 11    | 47.11         | 47.80        | 13.67         | 42.74        | 60.78                        | 65.98        | 39.22             | 25.42        |
| 12    | 42.79         | 30.69        | 22.02         | 27.90        | 64.81                        | 51.56        | 35.19             | 40.22        |



TABLE 21 (PART 2)

TYPES OF ADVERBIAL CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | Condition  |              | Consequence |           | Comparison |           | Concession |           |
|-------|------------|--------------|-------------|-----------|------------|-----------|------------|-----------|
|       | High Group | Random Group | High Group  | Low Group | High Group | Low Group | High Group | Low Group |
| 4     | 7.89       | 8.33         | 2.63        | 4.17      | 0.00       | 75.00     | 0.00       | 0.00      |
| 5     | 13.94      | 7.02         | 12.27       | 10.53     | 0.00       | 10.00     | 0.00       | 2.63      |
| 6     | 8.64       | 4.74         | 2.38        | 0.00      | 4.94       | 5.56      | 1.85       | 1.32      |
| 7     | 3.98       | 5.00         | 4.11        | 2.80      | 5.56       | 5.26      | 2.22       | 0.80      |
| 8     | 5.48       | 5.57         | 3.91        | 5.75      | 1.01       | 3.07      | 5.39       | 4.02      |
| 9     | 6.60       | 12.30        | 0.78        | 3.51      | 5.21       | 2.63      | 3.12       | 1.19      |
| 10    | 13.67      | 9.25         | 5.89        | 3.12      | 2.09       | 0.83      | 6.47       | 1.49      |
| 11    | 8.45       | 13.31        | 2.95        | 4.01      | 6.57       | 4.76      | 10.35      | 7.70      |
| 12    | 18.36      | 15.56        | 4.49        | 7.55      | 3.25       | 6.15      | 3.02       | 9.13      |
|       |            |              |             |           |            |           |            | 4.49      |

TABLE 21 (PART 3)

TYPES OF ADVERBIAL CLAUSES -- WRITTEN LANGUAGE  
(in percent)

| Grade | High Group | Purpose      |           | High Group | Manner       |           | High Group | Place        |           | High Group | Degree       |           |
|-------|------------|--------------|-----------|------------|--------------|-----------|------------|--------------|-----------|------------|--------------|-----------|
|       |            | Random Group | Low Group |            | Random Group | Low Group |            | Random Group | Low Group |            | Random Group | Low Group |
| 4     | 6.00       | 12.50        | 0.00      | 5.26       | 4.17         | 0.00      | 0.00       | 0.00         | 0.00      | 5.26       | 4.17         | 0.00      |
| 5     | 0.91       | 5.26         | 0.00      | 1.52       | 0.00         | 0.00      | 6.82       | 10.53        | 0.00      | 3.18       | 0.00         | 0.00      |
| 6     | 0.53       | 2.63         | 16.67     | 0.00       | 0.00         | 0.00      | 0.00       | 0.00         | 0.00      | 11.11      | 2.63         | 0.00      |
| 7     | 1.59       | 4.80         | 2.63      | 1.11       | 0.00         | 0.00      | 1.67       | 0.00         | 0.00      | 5.11       | 6.00         | 5.26      |
| 8     | 1.01       | 1.72         | 0.00      | 5.15       | 1.82         | 0.00      | 0.00       | 0.00         | 0.00      | 1.01       | 1.25         | 1.75      |
| 9     | 3.65       | 1.79         | 1.75      | 0.00       | 2.84         | 1.75      | 0.00       | 0.00         | 4.39      | 0.78       | 0.89         | 2.63      |
| 10    | 0.00       | 2.71         | 2.74      | 3.07       | 4.41         | 3.89      | 0.00       | 1.25         | 2.44      | 1.04       | 4.61         | 1.33      |
| 11    | 0.51       | 0.53         | 3.17      | 4.57       | 1.27         | 0.00      | 5.05       | 1.23         | 1.63      | 0.78       | 0.41         | 0.68      |
| 12    | 0.00       | 2.53         | 2.63      | 5.83       | 7.26         | 5.83      | 0.00       | 1.01         | 0.00      | 0.24       | 4.39         | 0.00      |

## PART VII: RESULTS OF THE INVESTIGATION -- WEIGHTED INDEX OF ELABORATION

In this research, the investigator has defined the elaboration of language as the use of various strategies of syntax by which the communication is expanded beyond a simple subject and predicate. Therefore, the study of elaboration deals with modification not only through dependent clauses but also through adjectives, adverbs, prepositional phrases, infinitives, appositives, gerunds, and all other strategies of expansion.<sup>1</sup>

### Elaboration Index -- Oral Language

For oral language the average number of elaboration points per communication unit moves upward steadily for all groups; however, in several instances, particularly in the Random group data and in the Low group data for grades eight through ten, we find plateaus indicating a possible consolidation phase before further growth achievement. (See Table 22 and Figure 15.)

On this measure, just as on many other segments where relative growth is a measurable phenomenon, the High group is approximately four years ahead of the Low group and two years ahead of the Random group. For example, the High group achieves 52.56 percent of its growth by grade one whereas the Low group achieves only 51.57 percent of its growth by grade five. The two-year differential between the High and Random groups prevails, but in some years the High group is three years ahead of the Random group.

In year-to-year velocity of growth, all groups exhibit strong upward shifts in grades four, six, and eleven although in many respects a more interesting way to examine the data is to view each group individually, noting that large upward shifts are typically followed by either retrenchment or a substantially lessened amount of growth in a subsequent year. (See Figure 15.)

### Elaboration Index -- Written Language

For written language the data on average number of elaboration points per communication unit indicate that the High group demonstrates the same degree of superiority over the Low and Random groups as evidenced in oral language, a superiority of approximately four years above the Low group and two years above the Random group. For example, the High group's average of 4.12 in grade four is not exceeded by the Low group until grade eight; more importantly, the superiority of the High group is consistent from grade four through grade twelve. (See Table 23 and Figure 16.)

Here, the investigator would like to stress that this superiority of the High group is particularly worthy of note, because this consistency

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<sup>1</sup> The Methods section of this monograph contains the precise weights assigned to each elaborated structure as well as an explanation of the basis by which the weights were decided.

TABLE 22

AVERAGE NUMBER OF ELABORATION INDEX POINTS PER COMMUNICATION UNIT -- ORAL LANGUAGE

| Grade | Elaboration Points per Unit |              |           | Relative Growth <sup>1</sup> |              |           | Year-to-Year Velocity <sup>2</sup> |              |           |
|-------|-----------------------------|--------------|-----------|------------------------------|--------------|-----------|------------------------------------|--------------|-----------|
|       | High Group                  | Random Group | Low Group | High Group                   | Random Group | Low Group | High Group                         | Random Group | Low Group |
| 1     | 3.18                        | 2.47         | 2.05      | 52.56                        | 40.83        | 33.88     | --                                 | --           | --        |
| 2     | 3.05                        | 2.73         | 2.43      | 50.41                        | 45.12        | 40.17     | - 2.15                             | + 4.29       | + 6.29    |
| 3     | 3.33                        | 2.78         | 2.57      | 55.04                        | 45.95        | 42.48     | + 4.63                             | + 0.83       | + 2.31    |
| 4     | 3.96                        | 3.63         | 2.98      | 65.45                        | 60.00        | 49.26     | +10.41                             | +14.05       | + 6.78    |
| 5     | 4.14                        | 3.67         | 3.12      | 68.43                        | 60.66        | 51.57     | + 2.98                             | + 0.66       | + 2.31    |
| 6     | 4.77                        | 4.33         | 3.46      | 78.84                        | 71.57        | 57.19     | +10.41                             | +10.91       | + 5.62    |
| 7     | 5.36                        | 4.38         | 3.94      | 88.60                        | 72.40        | 65.12     | + 9.76                             | + 0.83       | + 7.93    |
| 8     | 5.48                        | 4.95         | 4.24      | 90.58                        | 81.82        | 70.08     | + 1.98                             | + 9.42       | + 4.96    |
| 9     | 5.70                        | 5.16         | 4.16      | 94.21                        | 85.29        | 68.76     | + 3.63                             | + 3.47       | - 1.32    |
| 10    | 5.93                        | 5.11         | 4.22      | 98.02                        | 84.46        | 69.75     | + 3.81                             | - 0.83       | + 0.99    |
| 11    | 6.80                        | 5.75         | 4.92      | 112.40                       | 95.04        | 81.32     | +14.38                             | +10.58       | +11.57    |
| 12    | 6.92                        | 6.05         | 5.41      | 114.38                       | 100.00       | 89.42     | + 1.98                             | + 4.96       | + 8.10    |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.



FIGURE 15

WEIGHTED INDEX OF ELABORATION --

ORAL LANGUAGE

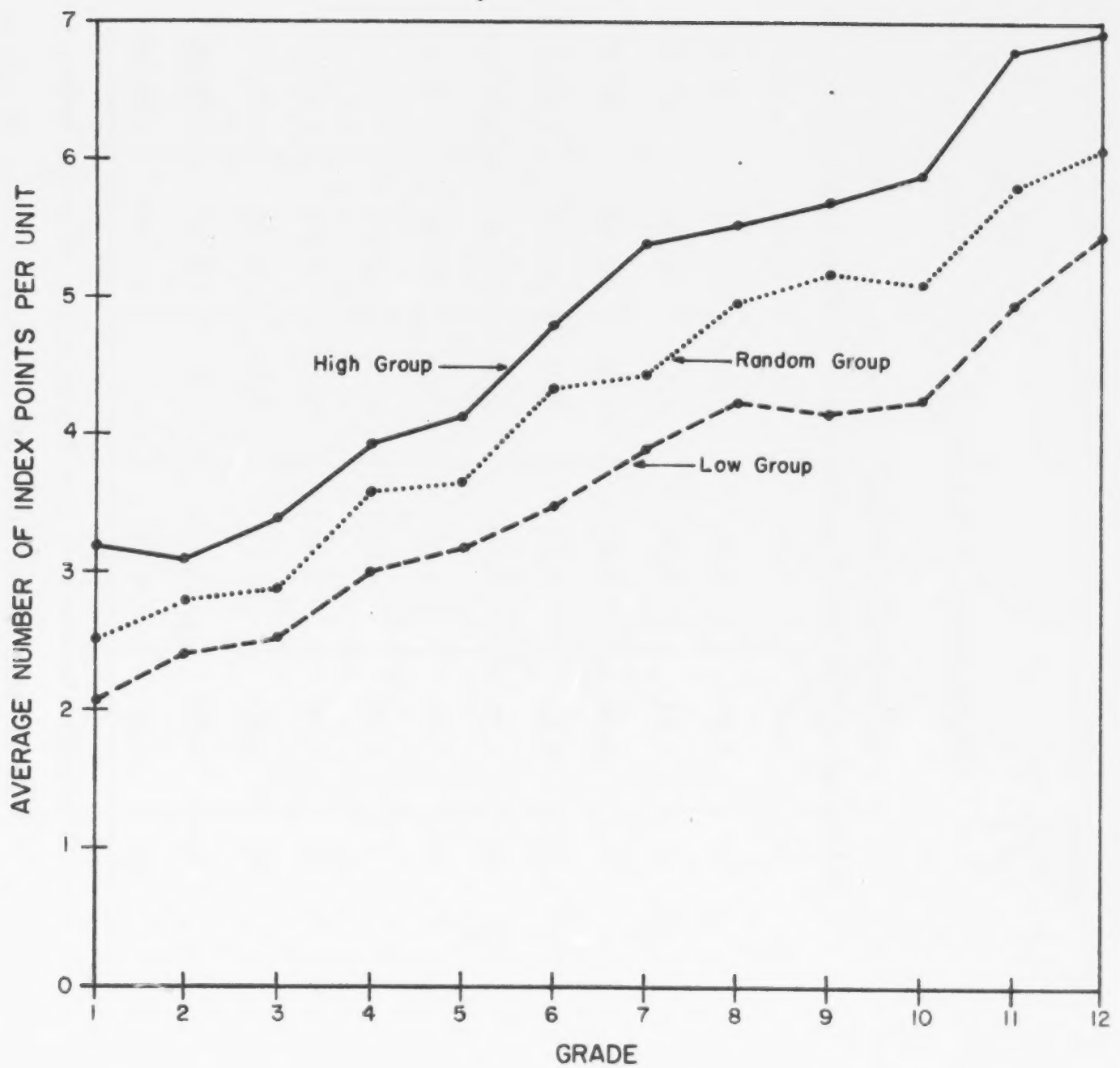


TABLE 23

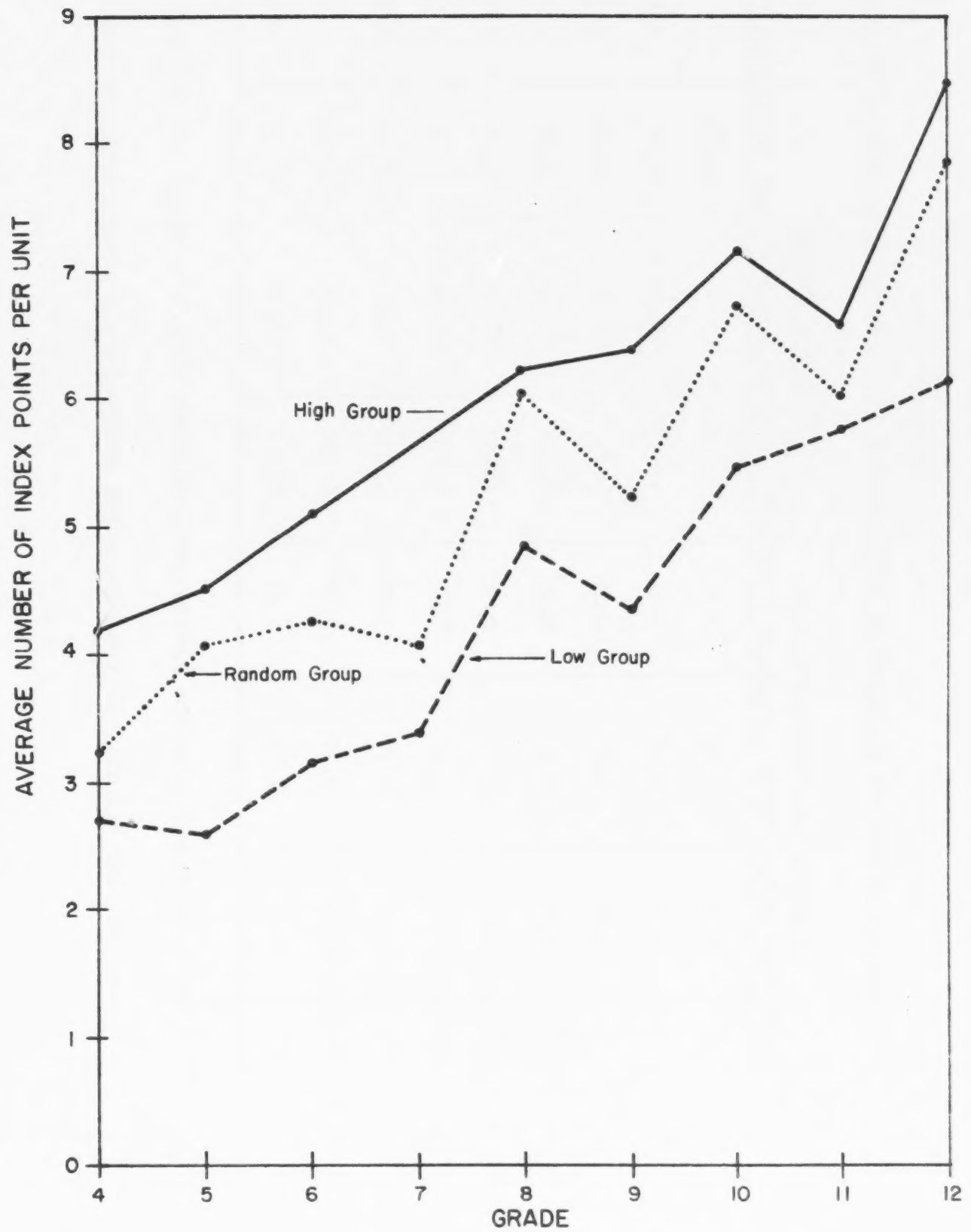
AVERAGE NUMBER OF ELABORATION INDEX POINTS PER COMMUNICATION UNIT -- WRITTEN LANGUAGE

| Grade | Elaboration Points per Unit |              |           | Relative Growth <sup>1</sup> |              |           | Year-to-Year Velocity <sup>2</sup> |              |           |
|-------|-----------------------------|--------------|-----------|------------------------------|--------------|-----------|------------------------------------|--------------|-----------|
|       | High Group                  | Random Group | Low Group | High Group                   | Random Group | Low Group | High Group                         | Random Group | Low Group |
| 4     | 4.12                        | 3.29         | 2.73      | 52.55                        | 41.96        | 34.82     | --                                 | --           | --        |
| 5     | 4.51                        | 4.08         | 2.64      | 57.53                        | 52.04        | 33.67     | + 4.98                             | +10.08       | - 1.15    |
| 6     | 5.06                        | 4.18         | 3.12      | 64.54                        | 53.32        | 39.80     | + 7.01                             | + 1.28       | + 6.13    |
| 7     | 5.62                        | 4.07         | 3.36      | 71.68                        | 51.91        | 42.86     | + 7.14                             | - 1.41       | + 3.06    |
| 8     | 6.22                        | 6.05         | 4.89      | 79.34                        | 77.17        | 62.37     | + 7.66                             | +25.26       | +19.51    |
| 9     | 6.41                        | 5.25         | 4.33      | 81.76                        | 66.96        | 55.23     | + 2.42                             | -10.21       | - 7.14    |
| 10    | 7.15                        | 6.79         | 5.40      | 91.20                        | 86.61        | 68.88     | + 9.44                             | +19.65       | +13.65    |
| 11    | 6.38                        | 5.97         | 5.72      | 81.38                        | 76.15        | 72.96     | - 9.82                             | -10.46       | + 4.08    |
| 12    | 8.51                        | 7.84         | 6.11      | 108.55                       | 100.00       | 77.93     | +27.17                             | +23.85       | + 4.97    |

<sup>1</sup> Relative Growth uses the Random group at grade twelve to equal 100 percent.<sup>2</sup> Year-to-Year Velocity is the percentage change in any given group from one year to the following year.

FIGURE 16

WEIGHTED INDEX OF ELABORATION -- WRITTEN LANGUAGE



was not found when we examined only dependent clauses in the subjects' writing. In other words, the elaboration index indicates that the High group shows an obvious superiority when ALL elaborated structures are considered whereas such a superiority does not exist (on written language during the high school years) if one ignores other elaborated structures and concentrates exclusively on dependent clauses.

#### Comparison of Oral and Written Language

Several interesting facets of the data may be observed by placing the oral and written elaboration averages side-by-side on the same table. (See Table 24.)

When examining Table 24, one notes first that the High group, with the exception of grade eleven, demonstrates a consistently higher number of elaboration points on written language than on oral language. However, when looking at the Random and Low groups, we can see that this same pattern is not in evidence. Instead, the Random and Low groups tend to use more elaboration in oral language from grades four through seven and then go through a transition which follows the High group pattern (more elaboration in written than in oral language). Apparently, learning to write in a code that uses a large repertoire of syntactical strategies develops more slowly for those who lack high proficiency in oral language when they begin school.



TABLE 24

COMPARISON OF ORAL AND WRITTEN ELABORATION POINTS PER COMMUNICATION UNIT

| Grade | <u>High Group</u> |         | <u>Random Group</u> |         | <u>Low Group</u> |         |
|-------|-------------------|---------|---------------------|---------|------------------|---------|
|       | Oral              | Written | Oral                | Written | Oral             | Written |
| 1     | 3.18              | --      | 2.47                | --      | 2.05             | --      |
| 2     | 3.05              | --      | 2.73                | --      | 2.43             | --      |
| 3     | 3.33              | --      | 2.78                | --      | 2.57             | --      |
| 4     | 3.96              | 4.12    | 3.63                | 3.29    | 2.98             | 2.73    |
| 5     | 4.14              | 4.51    | 3.67                | 4.08    | 3.12             | 2.64    |
| 6     | 4.77              | 5.06    | 4.33                | 4.18    | 3.46             | 3.12    |
| 7     | 5.36              | 5.62    | 4.38                | 4.07    | 3.94             | 3.36    |
| 8     | 5.48              | 6.22    | 4.95                | 6.05    | 4.24             | 4.89    |
| 9     | 5.70              | 6.41    | 5.16                | 5.25    | 4.16             | 4.33    |
| 10    | 5.93              | 7.15    | 5.11                | 6.79    | 4.22             | 5.40    |
| 11    | 6.80              | 6.38    | 5.75                | 5.97    | 4.92             | 5.72    |
| 12    | 6.92              | 8.51    | 6.05                | 7.84    | 5.41             | 6.11    |

## PART VIII: RESULTS OF THE INVESTIGATION -- TRANSFORMATIONAL ANALYSIS

by Francis Hubbard

Transformational grammar, like any other grammar, attempts to state in orderly fashion what any native speaker knows about his language. However, because of a unique set of assumptions about language and also because of some very strict requirements made of it, transformational grammar does not look much like any other kind.

The primary assumption is that language is far more regular than other kinds of grammars have indicated. This assumption accounts for the most important of the strict requirements--that a grammar should "capture" or be able to describe and explain any observed regularity in a language. Motivation for this assumption and its associated requirement comes from simply seeing that much regularity has gone unexplained and even unnoticed by previous grammars.

The second assumption concerns the form a proper account of all observable regularities should take. It would not do, obviously, to present an account of the structure of every possible sentence in a language because it can easily be shown that all natural languages contain an infinite number of sentences. But neither will it do simply to list all the words in a language because although that list would be finite, it would contain no information on how words are put together or on how various kinds of sentences are related. What is sought, then, is a basic sentence type to which all other sentence types can be related. Unfortunately, there seem to be several different basic sentence types as well as an enormous number of changes that can be seen to relate these types to other sentences. Given this fact, another requirement can be imposed on a proper grammar--that it be as brief and simple as possible.

As a consequence of this latter requirement, a third assumption is made. Anyone who has seen transcripts of actual speech knows that the form we would all identify as a good sentence is quite rare; many other phenomena seem to interfere with achieving such polish. Therefore, transformational grammarians (remember that the field is only fifteen years old) have decided that they will abstract from the performance of a speaker in a language and deal with that form called a good sentence. This can be stated as the assumption that a grammar should first explain every speaker's competence to perform in a language before it begins to deal with the actual performance itself. The corresponding requirement is that transformational grammar should, for the moment at least, ignore the process of producing a sentence as it goes on in someone's brain and deal only with the logical structure of such production somewhat analogously to the way an electronic schematic diagram ignores the actual physical structure of a radio but gives the outline for how the parts must be assembled.

The second and third assumptions lead to a fourth assumption, that actual sentences such as might be spoken will appear at only one place in our account of the structure of any sentence--at the end. The reason

for this is that such sentences contain many elements which, although they can be predicted by rules (such as agreement in number), do not contribute to what is called above the logical structure of the sentence. In another and more popular terminology, a grammar relates semantic information and actual sounds; even though the sounds are related to the meaning, they must necessarily be given in a string, linearly, and that is not the most efficient (brief and simple) form for giving the relations among the parts. The corresponding requirement here is that the grammar must abstract those relations and not merely label the parts.

At this point, the second assumption becomes more tangible. We need one kind of equipment for giving the semantic and grammatical relations, and another kind for rendering that structure into a linear form. The first kind of equipment is conventionally called the base or the phrase-structure rules, and the second, called the "syntactic component," includes transformations.

Some transformations will be mentioned in the analysis of every sentence (such as agreement in number); others will not (such as that found only in the analysis of passive sentences). But the notion of a basic sentence type has now become rather elusive. Even the simplest active declarative sentence will have undergone some transformations which will not have been applied to the closely related or corresponding sentence when embedded in another sentence (e.g., "John walked" vs. "We saw John walk"), and yet between the isolated form and the embedded form there are regularities which a grammar should account for. Consequently, the idea of a basic sentence type is too simple; what it purports to describe is really a two-dimensional structure, not linear like a sentence. The information it was designed to deal with can perhaps only be stated negatively--the simplest path of derivation may be that which contains no use of passive, interrogative, or imperative transformations and which contains only one complete set of grammatical relations.

A corollary of assumption three should also be made explicit. Just as transformational grammar makes no claims about how a sentence actually gets produced, but merely works backwards from the sentence to what must be assumed to underlie it, so it makes no claims about how competence in a language is acquired. Inasmuch as we have no direct intuitions about base components or transformations, it seems unlikely that the one is acquired prior to the other, and it seems more likely that the entire equipment is present in highly simplified form from the time a child begins to speak. After all, this model for relating sound and meaning was set up to be as general as possible, and clearly children's use of language must fall within its scope, relating sound and meaning as a child does. (It is generally assumed by most people currently working on the problem within the field of linguistics that children's grammars are largely complete by the age of five or six.)

But if it is not possible to give an account of how a child acquires the ability to speak a language (at least as yet), it certainly is possible to give an account of what the language is that, at any age, he is



speaking. If a grammarian is given a large enough sample of a child's actual speech, he can set up a base and a list of transformations as well as compile a lexicon. Every child's language can be assumed to be adequate for his purposes (because if it isn't he will change it) at the given time, and no value judgments should be made based on the complexity of the grammar a child seems to use. The process of finding the grammar which best explains a child's speech is no different from the process by which a grammarian would work from any given sample of language (his own, literary sources, or whatever) to a grammar for it.

One point in the preceding paragraph needs final emphasis. There is no a priori reason for thinking that the relative complexity of a child's grammar correlates to intelligence, social background, or anything else. Just as every language known in the world is said to satisfy the communicative needs of its users (by definition; if it didn't, it wouldn't be complete as a language), so every child's language is adequate for his communicative needs at the moment the language is sampled. This is not a matter of psychology but of linguistic theory and more precisely of the present limitations of linguistic theory. It amounts to the confession that from all we have said, nothing follows about how to measure the complexity of a given language nor about how to compare two languages with respect to complexity. Complexity viewed as the number of different sentence forms a child can produce seems no more significant than, say, the number of ways in which he can relate a sentence to the one preceding it, or to the number of ways in which he can organize a whole group of sentences. In fact, the number of sentence forms may be a very misleading statistic; every sentence seems to be the result of a large number of steps (from a logical point of view, anyway), and the formal differences are produced by relatively few steps. This confession about the inability of transformational grammar to deal with discourse in general (at the present time) is the opposite side of the coin from something discussed under assumption two--that transformational grammar is at present a sentence grammar only. In other words, for present purposes, formal complexity may turn out to be important, and it may not; the issue is an empirical one. Having a large number of alternatives to choose from for the structure of one sentence might, for example, be related to having few alternatives for relating one sentence to another.

Six subjects were chosen for the transformational analysis: two each (one boy and one girl) from the High, Random, and Low groups. (See Table 25.) The following aspects of the analysis are significant in their implications.

1. The boys use more transformations than the girls.
2. Both in the early three years of elementary school and the last three years of high school, the high subjects use more transformations than the random subjects and almost twice as many transformations as the low subjects.



TABLE 25

TRANSFORMATIONAL ANALYSIS: SUMMARY OF OVERALL TOTALS<sup>1</sup>

| Transformations          | Early Years |        |        |        |      |        | Late Years |        |        |        |      |        |
|--------------------------|-------------|--------|--------|--------|------|--------|------------|--------|--------|--------|------|--------|
|                          | High        |        | Random |        | Low  |        | High       |        | Random |        | Low  |        |
|                          | Male        | Female | Male   | Female | Male | Female | Male       | Female | Male   | Female | Male | Female |
| Single-base              | 45          | 19     | 17     | 21     | 17   | 21     | 42         | 25     | 32     | 31     | 31   | 21     |
| Multi-base<br>(full)     | 25          | 15     | 9      | 9      | 13   | 15     | 54         | 50     | 19     | 40     | 30   | 24     |
| Multi-base<br>(deletion) | 34          | 37     | 32     | 30     | 17   | 12     | 46         | 49     | 41     | 33     | 34   | 16     |
| Total                    | 104         | 71     | 58     | 60     | 47   | 48     | 142        | 124    | 92     | 104    | 95   | 61     |

## Total Transforms

| Boys<br>plus<br>Girls | Early Years |        | Late Years |     | Total |
|-----------------------|-------------|--------|------------|-----|-------|
|                       | High        | Random | Low        |     |       |
|                       | 175         | 118    | 95         | 266 | 441   |
|                       |             |        |            | 196 | 314   |
|                       |             |        |            | 156 | 251   |
| All Boys              | 209         |        |            | 329 | 538   |
| All Girls             | 179         |        |            | 289 | 468   |

<sup>1</sup> Using two high subjects, two random subjects, and two low subjects for grades one, two, and three and grades ten, eleven, and twelve with a total of 180 units per subject (30 units x 6 grades).

3. Note the results on the multi-base deletion transforms. We are especially interested in these as examples of closely coiling thought into a minimum of speech.

|       |        | <u>Early Years</u> | <u>Late Years</u> |
|-------|--------|--------------------|-------------------|
| Boys  | High   | 71                 | 95                |
| plus  | Random | 62                 | 74                |
| Girls | Low    | 29                 | 50                |

Note, too, that the low subjects progress the most in terms of their beginning point; even so, they are still producing only about half as many deletion transforms as the high subjects.

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## PART IX: RESULTS OF THE INVESTIGATION -- STUDY OF VERBS

In any language, mastering the system of verbs is crucial to effectively knowing and using that language; and as the investigator has indicated in the Methods section of this monograph, a number of researchers have studied this aspect of English.

For the present investigation, using the selected communication units on the subjects' elaboration data sheets, we obtained data on verb density and on the proportions of finite and non-finite verbs out of total verbs.<sup>1</sup>

### Verb Density -- Oral and Written Language

In this research each individual verb word was counted separately. For example, if a subject says "I ran," his verb count is one; if he says "I would have gone," his verb count is three. For any given grade, a subject's total verb words were tabulated and a calculation was made to obtain the measure of verb words as a percentage of words in communication units.

From looking at the data, the reader can see that the findings are completely negative. (See Table 26.) In other words, verb density does not appear to distinguish among the groups, and this is true not only for oral language but also for written language. There does not seem to be any growth in verb density nor is there any consistent pattern other than a very slight percentage superiority of verb density in written language as compared to oral language. However, even this generalization does not always hold true; we find, in both oral and written language, that on the measure of verb density the High group sometimes exceeds the Low group, the Low group sometimes exceeds the High group, and the Random group sometimes exceeds both the High and Low groups. Thus, the only conclusion we are able to draw is that we must go beyond a mere calculation of verb density and examine the use of non-finite verbs (infinitives, participles, and gerunds).

### Non-Finite Verbs as a Percentage of Total Verbs -- Oral and Written Language

Because of the limitations of time and money, this final segment of the research has been presented in a more limited manner than the previous data. However, the findings appear sufficient to suggest several very meaningful conclusions.

A word of caution: the reader should have clearly in mind exactly what is being measured. In the previous section, we examined total verb

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<sup>1</sup> Non-finite verbs are infinitives, participles, and gerunds; finite verbs are those requiring a subject and capable of taking a subject from this list: it, I, we, you, he, she, they.

TABLE 26

VERB WORDS AS A PERCENTAGE OF WORDS IN COMMUNICATION UNITS --

ORAL AND WRITTEN LANGUAGE  
(in percent)

| Grade | <u>Oral</u> |              |           | <u>Written</u> |              |           |
|-------|-------------|--------------|-----------|----------------|--------------|-----------|
|       | High Group  | Random Group | Low Group | High Group     | Random Group | Low Group |
| 1     | 21.89       | 22.76        | 24.12     | --             | --           | --        |
| 2     | 21.81       | 22.75        | 23.66     | --             | --           | --        |
| 3     | 21.77       | 22.46        | 22.57     | --             | --           | --        |
| 4     | 21.73       | 22.03        | 22.29     | 24.30          | 23.80        | 21.56     |
| 5     | 21.45       | 22.14        | 22.97     | 23.75          | 23.61        | 20.92     |
| 6     | 20.94       | 21.51        | 22.43     | 23.18          | 24.79        | 19.73     |
| 7     | 21.01       | 21.60        | 22.12     | 22.45          | 24.67        | 23.92     |
| 8     | 20.00       | 21.37        | 21.54     | 21.79          | 22.33        | 22.32     |
| 9     | 20.55       | 21.03        | 22.38     | 21.74          | 22.74        | 21.57     |
| 10    | 21.05       | 23.01        | 22.97     | 21.44          | 23.38        | 23.74     |
| 11    | 21.60       | 22.62        | 22.66     | 22.06          | 24.40        | 24.31     |
| 12    | 21.11       | 21.59        | 22.72     | 21.86          | 22.72        | 22.98     |



words as a percentage of all words in units and found that approximately one word in five is a verb word (roughly 20 percent although in some cases the percentages were closer to 25 percent--i.e., one verb word out of every four words). In the present analysis we are concentrating on non-finite verbs as a percentage of total verbs (not total words in units). Therefore, a figure of 10 percent would indicate that 10 percent of the verb words are non-finite and the remaining 90 percent are finite.

Examining the oral data on non-finite verbs, the first clear feature one notices is that both the High and Low groups exhibit a measurable growth from the early years to the late years. (See the top portion of Table 27.) However, the growth (for both groups) is limited to gerunds and infinitives with relatively constant percentages for participles.<sup>1</sup> An additional feature of the data is that in the late years the Low group actually tends to use a greater proportion of infinitives than the High group.

In reality, the difference between the High and Low group is not particularly large. (For example, in grade twelve the Total column indicates High = 9.91 percent and Low = 10.55 percent.) Therefore, our only conclusion is that on oral language even the proportions of non-finite verbs do not distinguish between those rated high in language proficiency and those rated low in language proficiency.

However, when examining written language, we find two notable phenomena: (1) the High group demonstrates an obvious percentage superiority over the Low group; and (2) the oral and written data actually move in opposite directions, with the High group showing substantially more non-finite verbs in written language than in oral language and the Low group showing substantially more non-finite verbs in oral language than in written language. From this observation we may conclude that those rated high in language are able to make a conscious effort to use non-finite verbs in their writing whereas those rated low in language are not only unable to make such a conscious effort but actually cannot even utilize in written language the full use of the non-finite verbs they are able to achieve in oral language.

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<sup>1</sup> We would also expect measurable growth in written language but have not as yet analyzed any years other than grades ten, eleven, and twelve.

TABLE 27

NON-FINITE VERBS AS A PERCENTAGE OF TOTAL VERBS --

ORAL AND WRITTEN LANGUAGE  
(in percent)

Oral

| Grade | <u>Participles</u> |           | <u>Gerunds</u> |           | <u>Infinitives</u> |           | <u>Total</u> |           |
|-------|--------------------|-----------|----------------|-----------|--------------------|-----------|--------------|-----------|
|       | High Group         | Low Group | High Group     | Low Group | High Group         | Low Group | High Group   | Low Group |
| 1     | 3.20               | 3.05      | 0.56           | 0.60      | 2.56               | 1.62      | 6.32         | 5.27      |
| 2     | 3.57               | 2.63      | 0.50           | 0.52      | 1.55               | 1.76      | 5.62         | 4.91      |
| 3     | 3.31               | 3.72      | 0.83           | 0.77      | 1.76               | 2.67      | 5.90         | 7.16      |
| 10    | 2.51               | 3.05      | 0.94           | 1.07      | 3.22               | 3.83      | 6.67         | 7.95      |
| 11    | 2.45               | 2.83      | 2.61           | 2.40      | 4.17               | 5.03      | 9.23         | 10.26     |
| 12    | 3.09               | 3.01      | 3.16           | 2.46      | 3.66               | 5.08      | 9.91         | 10.55     |

Written

|    |      |      |      |      |      |      |       |      |
|----|------|------|------|------|------|------|-------|------|
| 10 | 4.13 | 1.36 | 3.22 | 2.26 | 4.53 | 2.38 | 11.88 | 6.00 |
| 11 | 3.57 | 1.63 | 2.54 | 0.72 | 4.52 | 4.22 | 10.62 | 6.57 |
| 12 | 4.47 | 2.60 | 4.14 | 2.28 | 5.08 | 3.46 | 13.68 | 8.33 |

## PART X: SUMMARY AND CONCLUSIONS<sup>1</sup>

### Background and Purpose

The research reported in the foregoing sections of this monograph is concerned specifically with the stages, velocity, and relative growth of children's language. The study, based on previous research conducted by the investigator, makes use of large quantities of untapped data obtained during an intensive, thirteen-year longitudinal study. The major questions forming the purposes and dimensions of the current three-year investigation were the following:

- . . . Does the growth in children's language follow a predictable sequence?
- . . . Can definite stages of language development be identified?
- . . . Can the velocity and relative growth in language ability be ascertained and predicted precisely?

### Design

In choosing the subjects for the longitudinal sample, care was taken to avoid any unique or unusual factors of selection. In addition, a stringent effort was made to ensure representativeness on the bases of sex, socio-economic status, ethnic background, and spread of intellectual ability.

For purposes of the present study, extensive research was done on three subgroups: a group high in language ability, a group low in language ability, and a Random group used in lieu of the total group. Thus, the statistical data in this three-year phase of the investigation is limited to the High and Low groups (each with an N of 35), selected on the basis of a thirteen-year cumulative average of teachers' ratings, and the Random group (N = 35), selected by a table of random numbers.

### Data Collected during the Longitudinal Study

Throughout the longitudinal study an effort was made to obtain as comprehensive a record as possible for each subject, not only on his linguistic growth and behavior but also on other variables possibly influencing how he learned to speak, read, write, and listen to the English language. Among the data collected are the following:

#### Oral Interviews

In the spring of every year, each subject remaining in the study was interviewed individually with his responses recorded on either a tape recorder or an audograph. In any given year the interviews were identical

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<sup>1</sup> This section of the monograph has been included for the benefit of those who do not have time to read the entire text. As a consequence, the material contained herein will seem repetitious to those who have read the monograph.

for all subjects; the format of the interviews was altered periodically during the course of the project to take into account the advancing age of the subjects.

#### Typed Transcripts

A group of highly trained typists have accurately transcribed the oral interviews according to a detailed set of instructions. Thus the present research draws upon approximately 3250 typed transcripts containing roughly 3,800,000 words of spoken language.

#### Written Compositions

Beginning in grade three, annual samples of written language were collected from all subjects remaining in the study.

#### Reading Tests

Test scores on either the Stanford or California test of reading achievement were accumulated from grade four through grade nine; these scores were converted to the number of years and months a given subject reads above or below his chronological age.

#### I.Q. Tests

As part of the data-gathering process, all available I.Q. scores were obtained for every subject in the study.

#### Listening Tests

In grades eight and nine and again in grades eleven and twelve, the STEP Test of Listening Ability was administered to the majority of subjects in the study.

#### Tests on the Use of Subordinating Connectives

Beginning in grade five and continuing through grade twelve a test of the ability to use subordinating connectives was administered to every subject remaining in the study.

#### Teachers' Ratings

In every year of the study each subject's teacher rated him on a specified series of language factors, with each factor scored on a five-point scale. Inasmuch as a cumulative average of teachers' ratings comprised the basis on which the investigator selected certain subgroups for special study (a group high in language proficiency and a group low in language proficiency), the scale merits particular attention.<sup>1</sup>

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<sup>1</sup> A sample of the teachers' rating scale may be found in the appendix of this monograph.



### Book Lists

Beginning in grade four and continuing through grade twelve, each subject was asked to list the books he had read during the previous year. For those subjects with such poor reading ability that they had not read a single book during the previous year, information was obtained on the magazines or comic books they had read in order to have at least some basis for determining their individual reading habits.

### Other Data

Among the other types of data accumulated during the course of the study were statements about the television programs the subjects watched, personality profiles, language questionnaires, records of school attendance, grades, and general state of health.

### Elaboration Data Sheets

For the present three-year phase of the investigation much of the analysis is exceedingly complex and time-consuming--not in the sense that the reader would have difficulty in comprehending it but rather that the methodology required many thousands of hours of refined, carefully coded work to make the results perfectly comparable from one year to the next and from one subgroup to another. For this reason, the analysis has been carried out on thirty communications units per year per subject.<sup>1</sup>

### The Communication Unit and the Maze

The definition of two terms is necessary to facilitate the comprehension of subsequent material summarized in this section.

#### The Communication Unit

The definition of the communication may be stated either semantically or structurally. In semantic terms it is what A. F. Watts described as "the natural linguistic unit," i.e., a group of words which cannot be further divided without the loss of their essential meaning.<sup>2</sup> However, despite the apparent clarity of Watts' definition, the investigator found that it was also necessary to define the unit of segmentation in structural terms.<sup>3</sup> Thus, in 1953 the investigator decided upon the term communication

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<sup>1</sup> Of course, this is still a large language sample. For example, in oral language it provides analysis on 37,800 communication units (35 subjects  $\times$  30 units  $\times$  3 groups  $\times$  12 years).

<sup>2</sup> Watts, op. cit., pp. 65-66.

<sup>3</sup> Actually, Watts' use of the term "essential meaning" would be difficult to define scientifically. As a consequence, the formal definition adopted for this research--that of an independent clause between two sentences--becomes more defensible than the semantic (or essential meaning) definition.

unit and defined it as each independent clause with its modifiers.<sup>1</sup> Kellogg W. Hunt, studying children's writing, uses this same method of segmentation; in Hunt's research this unit has been termed a T-Unit rather than a communication unit.<sup>2</sup>

As an illustration of what does or does not comprise a communication unit, a very simple example may be given. In terms of semantics, if one were to say "I know a boy with red hair," the words would constitute a unit of communication. However, if the words "with red hair" had been omitted (chopped off, so to speak, by a different method of segmentation), the essential meaning of that particular unit of communication would have been changed. "I know a boy" does not mean the same thing as "I know a boy with red hair." Furthermore, the phrase "with red hair" left dangling by itself lacks completion. However, segmenting by meaning (semantics) offers too many opportunities for disagreement; therefore, the real process of segmentation devolves upon structure (each independent predication with all of its modifiers) double-checked whenever necessary by the intonation patterns of the human voice--pitch, stress, and pause. Thus, in all cases the words comprising a communication unit will fall into one of the following three categories:

- |                                                                                                                                                                |                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|
| (1) each independent grammatical predication                                                                                                                   |                                                                |
| (2) each answer to a question, provided that the answer lacks only the repetition of the question elements to satisfy the criterion of independent predication | } These two are necessary in oral but not in written language. |
| (3) each word such as "Yes" or "No" when given in answer to a question such as "Have you ever been sick?"                                                      |                                                                |

By definition, then, these units are not exclusively semantic. They are also syntactic, being composed of independent predications; they can be identified by their form as well as by their meaning.

#### The Maze

A maze is a series of words or initial parts of words which do not add up to a meaningful communication unit. It is an unattached fragment or a series of unattached fragments which do not constitute a communication unit and are not necessary to the communication unit.

<sup>1</sup> Some linguists have been critical of any use of "communication" or "meaning," urging a rigorous use of structure alone. The investigator, however, has seen no problem in using meaning as a double-check on the structural methodology actually being used; some mistakes have been located in this way, no dilemmas have arisen, and the research has retained a closer alliance with the ultimate purpose of language.

<sup>2</sup> Hunt, op. cit.

A maze may be short, consisting of only one word or one fragment of a word; conversely, any given maze may consist of from ten to twenty or more words or fragments of words. In many respects this particular form of language behavior resembles the physical behavior of someone who is trapped in a spatial maze.<sup>1</sup>

#### Hypotheses Being Tested

During the course of the research the answers to a series of hypotheses have been gained in varying exactitude. These are summarized below and are accompanied by cross-references indicating where more detailed information may be found.

1. Hypothesis: By using a specified set of data for subjects in grades one, two, and three, it will be possible to construct a model by which one may predict precisely the language ability of those same subjects in grades ten, eleven, and twelve.

Conclusion: Not only has it been possible to construct such a model but eight subgroups, each with predictable features of language, have been clearly identified. A more complete summary of this second project may be found in Part IV of this monograph.<sup>2</sup>

2. Hypothesis: Predictable stages of growth on each feature of language will emerge and can be identified for each group of subjects studied.

Conclusion: Most measures tested reveal not only stages of growth but large differences among the groups. Stages of growth do not necessarily occur at the same time or same rate for each of the three groups studied. However, the statistical and graphic presentation in this monograph clearly indicate that definite stages do exist and that growth is often followed by a consolidation or slight regression, suggesting that the subjects must absorb what they have learned before accomplishing further growth.

In some cases hypotheses have not proved valid. For example, Part IX of this monograph indicates a completely negative finding on verb density--no growth, no stages of growth, and no discernible differences among the groups. However, this in itself is a predictive finding. In other words, the overall longitudinal research was carefully designed to contain a

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<sup>1</sup> In Hunt's research these language tangles are termed garbles rather than mazes.

<sup>2</sup> For the monograph dealing with this predictive model, see Leonard Marascuilo and Walter Loban, An Empirical Study of the Dominating Predictive Features of Spoken Language in a Representative Sample of School Pupils: A Multivariate Description and Analysis of Oral Language Development (Project Number 7-I-106, report to the U.S. Office of Education, 1969).



stratified sample of a large urban population; complete longitudinal data were obtained on 211 urban subjects in the sample population, using sex, ethnic background, socio-economic status, and spread of intellectual ability as the initial bases for selection; and from this, one may reasonably conclude that the findings of the longitudinal research may be generalized to any large urban population in twentieth-century America. Thus, when any given finding is either clearly positive or clearly negative, we may predict with confidence that this same result will occur in any comparable school system.

The main focus of the research was on the subjects' oral language--although at the same time, beginning in grade three, annual samples of the subjects' written language were also obtained; therefore, in many cases the findings of the research may be generalized to both oral and written language.

On some measures, such as average number of words per communication unit, ability to elaborate the basic subject-verb, conventionality of English usage, and the use of subordinating connectors,<sup>1</sup> the differences among the High, Low, and Random groups are so clearly defined and so positive that there can be no doubt that we have ascertained and measured totally different abilities on the part of the subjects. Thus, the one overall predictive generalization we are able to make is that those who enter school with high language ability remain high throughout the entire period of their schooling, the low remain low, and the typical (random) remain in a central position.

3. Hypothesis: The stages and velocity of language growth will not show a steady, even pattern. Instead, there will be spurts of growth followed by plateaus, each of which can be identified.

Conclusion: Although the conclusion on this hypothesis has actually been stated above, the investigator would like to emphasize that on some measures there are not only plateaus but regressions.

4. Hypothesis: In speech, reading, writing, and listening a strong positive correlation will be found. Only rarely will a subject show proficiency in one language art and a lack of proficiency in a second language art. Such subjects merit special study.

Conclusion: Interrelations among the language arts have not actually been discussed in this monograph except insofar as the oral and written language data indicate an extremely strong positive relationship on these language factors. For more detailed information on interrelations among the language arts, see Walter Loban, Language Ability: Grades Seven, Eight, and Nine (Washington, D.C.: U.S. Government Printing Office, 1966).

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<sup>1</sup> A complete study of the use of subordinating connectors in both oral and written language has not yet been completed. However, from the data examined, the differences among the groups seem apparent.



5. Hypothesis: It will be possible to construct a weighted index of elaborated usage, an index which will correlate highly with other measures of language competence.

Conclusion: Tables on correlation coefficients have not been included in this monograph. The hypothesis proves correct, however, and the high positive correlations between the elaboration index and other language measures may be found in the Marascuilo-Loban monograph cited above.

6. Hypothesis: Subjects from above-average socio-economic status will develop language power earlier and to a greater competency than subjects from below-average socio-economic status.

Conclusion: Part III of this monograph indicates clearly that the High group is predominantly of high socio-economic status and the Low group is predominantly of low socio-economic status.

7. Hypothesis: Nonstandard English usage will be significantly less frequent for subjects of above-average socio-economic status than for those of below-average socio-economic status.

Conclusion: The hypothesis has proved correct. For an extensive discussion of nonstandard English usage, see Walter Loban, Problems in Oral English (Champaign, Illinois: National Council of Teachers of English, 1966).

8. Hypothesis: Subjects proficient in language will use more optional grammatical transformations in their sentence structures and will be more accurate in their obligatory grammatical transformations than those lacking in proficiency.

Conclusion: Although a transformational analysis has been done on only six subjects in this research (Part VIII of this monograph), it seems quite obvious that this limited analysis substantiates the hypothesis.

9. Hypothesis: Subjects with high language proficiency will more frequently use phrases of all kinds in preference to subordinate clauses whenever a choice between the two is possible.

Conclusion: The data on the weighted index of all forms of elaboration supports a positive finding since it places the High group substantially above the Low group whereas dependent clause measures alone do not indicate such enormous differences between the High and Low groups.

10. Hypothesis: Subjects with high language proficiency will use relational words such as moreover, although, because, etc., more accurately and at an earlier age than other subjects.

Conclusion: The findings have totally substantiated this hypothesis, and data are included in the Loban monograph published by the U.S. Government Printing Office (cited above).

11. Hypothesis: Subjects with high ability in language will use more adverbial clauses of cause, concession, and condition than subjects with low ability in language.

Conclusion: This hypothesis tends to be supported by the findings, but these tendencies are not so clearly defined that the hypothesis can be considered proved.

### Statistical Findings

To facilitate a clear comprehension of the data studied and the statistical findings resulting from that data, the investigator has included below a short summary, indicating on a table-by-table basis the section of the monograph where a discussion of the data may be located and a brief statement of what was ascertained.

### Part III: Statistical Description of the Sample

#### Table 1: Socio-Economic Status by Ethnic Group

Finding: The High group is predominantly Caucasian of high socio-economic status; the Low group tends to be Negro of low socio-economic status although approximately one-third of the Low group is Caucasian and about 10 percent are Oriental. As one might expect, the Random group is a mixture of ethnic groups and socio-economic ratings.

#### Table 2: Kuhlman-Anderson I.Q. Scores

Finding: The High group has a median I.Q. of 116; the Random group, 100; and the Low group, 88.

### Part IV: Prediction and Evaluation of Language Growth<sup>1</sup>

#### Table 3: Multiple Regression Analysis of Elaboration Index on Fluency and Dependent Clauses Measured at Grades One, Two, and Three

Finding: The findings are significant at better than the .05 level, indicating that two measures--length of communication unit and ratio of dependent clauses--may furnish sufficient basis for distinguishing among the eight identified groups in grades one, two, and three. Thus, the more complex elaboration index need not be used in the primary school years.

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<sup>1</sup> The reader should note that this section of the monograph contains a brief summary of an altogether different project conducted by the investigator and Dr. Leonard Marascuilo of the University of California. The eight subgroups discussed should not be confused with the High, Low, and Random groups which have been studied throughout the present monograph.

Table 4: Predicted Elaboration Index Standardized Value from Observed Standardized Fluency and Dependent Clause Scores

Finding: Using standardized scores on average number of words per unit and on average number of dependent clauses per unit allows one to predict a score on the weighted index of elaboration for oral language in grades one, two, and three.

Part V: Basic Measures

Table 5: Average Number of Words per Communication Unit -- Oral Language

Finding: Upward growth is demonstrated by all groups (High, Low, and Random); the High group is approximately four or five years ahead of the Low group and between one and three years ahead of the Random group.

Table 6: Maze Words as a Percentage of Total Words -- Oral Language

Finding: The High, Low, and Random groups all have virtually the same proportion of maze words at grade twelve as they had at grade one; the Low group consistently has a greater problem with mazes than the High or Random group.

Table 7: Average Number of Words per Maze -- Oral Language

Finding: This measure is not remarkably precise because it tends to underestimate the Low group's difficulty with mazes. However, it is of interest since it emphasizes the fact that the High group (except at grade one) invariably uses a lower average number of words per maze than the Low group while simultaneously using a higher average number of words per communication unit.

Table 8: Average Number of Words per Communication Unit -- Written Language

Finding: For each group, a large upward trend is generally followed by a downward shift, leading one to conclude that possibly each group tends on occasion to over-reach its abilities. However, on this measure the High group exhibits in written language the same degree of superiority it exhibits in oral language.

Table 9: Average Number of Words per Communication Unit -- Comparison of Oral and Written Language

Finding: This shows the High group's superiority, the most important feature of this table. Also, there is the indication that in any given grade each group of subjects tends to speak and write in units of virtually the same average length.



## Part VI: Special Study of Dependent Clauses

Table 10: Average Number of Dependent Clauses per Communication Unit -- Oral Language

Finding: On this measure the High group is again approximately four or five years ahead of the Low group and two or three years ahead of the Random group. An interesting feature of the data is that the Low group demonstrates a four-fold increase in use of dependent clauses from grade one to grade twelve whereas the High group shows only a three-fold increase. In other words, observed in terms of itself rather than compared to the High group, the Low group does in fact exhibit substantial growth.

Table 11: Average Number of Dependent Clauses per Communication Unit -- Written Language

Finding: On this measure the three groups give the impression of converging in the later years of schooling (grades nine through twelve). However, this segment of the data provides a perfect example of why one often must look beyond the mere statistical presentation in order to reach a valid conclusion. The phenomenon which is evidently occurring is that the High group is using a wide range of phrases and other elaborated structures in lieu of dependent clauses. This becomes clear when we later examine the weighted index of elaboration and observe the huge differences among the groups on oral and written language.

Table 12: Words in Dependent Clauses as a Percentage of Words in Communication Units -- Oral Language

Finding: All groups show a steady upward trend on this measure. The High group demonstrates its same degree of superiority, remaining throughout the entire period of its schooling approximately four years above the Low group and two years above the Random group.

Table 13: Words in Dependent Clauses as a Percentage of Words in Communication Units -- Written Language

Finding: On this measure, just as on average number of dependent clauses per unit (written), the groups give the impression of converging in grades nine through twelve. Again, this apparently results from the High group's using phrases and other elaborated structures in lieu of dependent clauses.

Table 14: Proportion of Noun, Adjectival, and Adverbial Clauses -- Oral Language

Finding: In grade twelve the Low and Random groups use virtually the identical percentage of adjectival clauses that they used in grade one, whereas the High group increases from 22 percent to 33 percent. Thus, the evidence seems clear that an exceptional speaker (High) will use progressively more adjectival clauses in his oral language (a greater percentage) whereas



the poor speaker (Low) or an average speaker (Random) will show no such percentage increase in the use of adjectival clauses.

Table 15: Proportion of Noun, Adjectival, and Adverbial Clauses --  
Written Language

Finding: In this segment of the data, the remarkable feature is that the Low group in grades eleven and twelve uses a higher percentage of adjectival clauses than either the High or Random group. This is of particular importance since it contradicts the widely held belief that using adjectival clauses is indicative of linguistic maturity.

Table 16: Relative Growth Rate of Noun, Adjectival, and Adverbial Clauses --  
Oral Language

Finding: When examining the growth data, one notices that the most striking feature is the High group's huge growth in the oral use of adjectival clauses (35 percent in grade one to 154 percent in grade twelve).

Table 17: Year-to-Year Velocity of Relative Growth Rates for Noun,  
Adjectival, and Adverbial Clauses -- Oral Language

Finding: In the year-to-year velocities, the most significant features of the data are the High group's growth on adjectival clauses--occurring mainly in junior high school and in grade eleven, the large increase in adjectival clauses for all groups in grade eight, and the large increase in adverbial clauses by the Low group in grade twelve. Further aspects of interest are contained in the summations of the twelve-year growth totals: all groups show relatively similar growth totals in noun and adverbial clauses whereas only the High group is able to achieve large growth in adjectival clauses.

Table 18: Functions of Noun Clauses -- Oral Language

Finding: All groups concentrate their usage of noun clauses in either direct objects or predicate nominatives. However, with increasing chronological age comes a shift toward the less common categories of noun clause functions, with a pronounced surge in this direction occurring at grade seven. The most important feature of the data is that no group shows a consistent superiority on any particular category of the less common noun clauses. Thus, the conclusion the investigator reaches is very similar to the one he reached from previous research into sentence patterns: it is not the type of pattern (or in this case the function of noun clause) that is significant but rather what the subject accomplishes within the structure in terms of elaborated usage and expanding his average number of words per communication unit.

Table 19: Functions of Noun Clauses -- Written Language

Finding: Just as in oral language, the findings show no positive differences among the groups on the less common categories of noun clauses. There

is a tendency for the High and Random groups to use more of the less common categories of noun clauses, and this is certainly more clearly defined than in the case of oral language. However, it is not so obvious that the investigator would draw any firm conclusions.

Table 20: Types of Adverbial Clauses -- Oral Language

Finding: Time and cause are the two types of adverbial clauses used most frequently by every group, accounting for approximately 75 percent of all adverbial clauses. In reference to the less common types of adverbial clause, one feature of the data is that the High and Random groups tend to show percentage concentrations in clauses of consequence and concession whereas for the Low group the concentration tends to be in clauses of purpose, manner, and place.

Table 21: Types of Adverbial Clauses -- Written Language

Finding: Again, time and cause are the predominant types of adverbial clause used by all groups. An additional aspect of the written language data--one tending to be at variance with the oral data--is that among the groups no obvious differences exist with respect to clauses of consequence or concession (oral language showing higher percentages for the High and Random groups) or with respect to clauses of purpose, manner, and place (oral language showing higher percentages for the Low group).

Table 22: Average Number of Elaboration Index Points per Communication Unit -- Oral Language

Finding: On this measure, just as on many other segments where relative growth is a measurable phenomenon, the High group is always approximately four years ahead of the Low group and two years ahead of the Random group. In year-to-year velocity of growth, all groups exhibit strong upward shifts in grades four, six, and eleven although in many respects a more interesting way to examine the data is to look at each group individually, noting that large upward shifts are typically followed by either retrenchment or a substantially lessened amount of growth in a subsequent year.

Table 23: Average Number of Elaboration Index Points per Communication Unit -- Written Language

Finding: For written language the data on average number of elaboration points per communication unit indicate that the High group demonstrates the same degree of superiority over the Low and Random groups as evidenced in oral language, a consistent and sustained superiority of approximately four years above the Low group and two years above the Random group. Here, the investigator would like to stress that this superiority of the High group is particularly noteworthy because this consistency was not found when we examined only dependent clauses in the subjects' writing. In other words, the elaboration index indicates that the High group shows an obvious superiority when ALL elaborated structures are considered whereas

such a superiority does not exist (during the high school years for written language) if one ignores other elaborated structures and concentrates exclusively on dependent clauses.

Table 24: Comparison of Oral and Written Elaboration Points per Communication Unit

Finding: The High group, with the exception of grade eleven, demonstrates a consistently higher number of elaboration points on written language than on oral language. However, when looking at the Random and Low groups, we can see that this same pattern does not occur. Instead, the Random and Low groups tend to use more elaboration in oral language from grades four through seven and then go through a transition which follows the High group pattern (more elaboration in written than in oral language). Apparently, learning to write in a code that uses a large repertoire of syntactical strategies develops more slowly for those who lack competence in oral language when they begin school.

Table 25: Transformational Analysis -- Summary of Overall Totals

Finding: Six subjects were studied (one boy and one girl from the High, Low, and Random groups). Given this limitation, the following generalizations may be made:

- (1) Boys use more transformations than girls.
- (2) High subjects use twice the number of transformations used by Low subjects (within identical numbers of communication units).
- (3) The High subjects show a very definite superiority on multi-based deletions--those features of language indicating a close coiling of thought into a minimum of speech.

Table 26: Verb Words as a Percentage of Words in Communication Units -- Oral and Written Language

Finding: The findings on verb density are totally negative, indicating no clear, measurable differences on either a year-to-year basis or a group-to-group basis. Verb density does not appear to be a valid characteristic for measuring differences between those rated high in language ability and those rated low in language ability.

Table 27: Non-Finite Verbs as a Percentage of Total Verbs -- Oral and Written Language

Finding: On oral language the percentage of non-finite verbs out of total verbs does not distinguish between the groups. However, on written language two crucial phenomena occur:

- (1) The High group demonstrates an obvious percentage superiority over the Low group.



- (2) The oral and written data actually move in opposite directions, with the High group showing substantially more non-finite verbs in written language than in oral language whereas the Low group shows substantially more non-finite verbs in oral language than in written language.

From this observation we may conclude that those rated high in language are able to make a conscious effort to use non-finite verbs in their writing whereas those rated low in language are not only unable to make such a conscious effort but actually cannot utilize in written language the full use of the non-finite verbs they are able to achieve in oral language.



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## APPENDIX A

### A Test of Subordinating, Coordinating, and Relational Words

The following test, designed to ascertain if the student is able to use appropriately 75 subordinating, coordinating, and relational words, was constructed on the basis of the research findings. The test itself was never used with the subjects in this research and has therefore not been validated by the investigator and his staff. Any classroom teacher may feel free to use the test without requesting permission from the investigator. However, the person should keep in mind the following:

(1) Since this test has not been validated, it may possibly require alteration; until validation is made, the investigator would not consider the test a finished product.

(2) As the test is printed here, the first choice in each item is always the correct answer. (a is always the most appropriate use of the word being tested.) Before using the test, one would naturally have to scramble the possible answers or a student could very quickly ascertain that a is always the correct answer.

(3) Each word (from the list provided below) has been tested twice. Thus, one could divide the test into two parts if this seemed best when administering the test to elementary school children. The rationale for designing the test using each word twice is that a student should be able to use the word appropriately two times during the test; if he is unable to do so, it implies that he correctly guessed the time he used the word correctly.

The words listed below are the test words, each of which has been tested twice unless otherwise indicated:<sup>1</sup>

|                     |                  |                    |
|---------------------|------------------|--------------------|
| accordingly         | because          | except that        |
| after               | before           | for example        |
| although            | besides          | for the most part  |
| as                  | certainly        | fortunately        |
| as a matter of fact | consequently     | furthermore        |
| as if (1 time)      | considering that | however            |
| as though (1 time)  | despite          | if possible        |
| at any rate         | either . . . or  | in a way           |
| at least            | even though      | in addition        |
| at the same time    | eventually       | in all probability |

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<sup>1</sup> The reader should note that 78 words are listed. In six cases, the variation on the particular test item was considered a test of essentially the same word.

in any event  
in fact  
in general  
in order that  
in spite of  
instead  
in the meantime  
in this respect  
just as (1 time)  
just so (1 time)  
lest  
meanwhile  
moreover  
neither . . . nor  
nevertheless (1 time)  
nonetheless (1 time)

notwithstanding  
of course  
on the contrary  
on the whole  
otherwise  
presumably  
provided that  
since  
somehow  
so that  
still  
than  
therefore  
thereupon  
though  
thus

undoubtedly  
unfortunately  
unless  
unquestionably  
until  
whatever  
whenever  
where  
whereas  
wherever  
whether or not  
which  
whichever  
while  
without  
yet

LOBAN - WILLIAMS  
A TEST OF SUBORDINATING, COORDINATING, AND RELATIONAL WORDS

1. My history lesson is very long; accordingly
  - a. I'll have to begin right after dinner.
  - b. that's what the teacher told us.
  - c. arithmetic is usually much shorter.
  - d. I seem to like it anyway.
2. We all want to win the game; accordingly
  - a. we'll have to work very hard.
  - b. except for just a few people.
  - c. or any other way.
  - d. by as big a score as possible.
3. I'm going to the store after
  - a. I finish my lunch.
  - b. someone is chasing me.
  - c. my homework takes too long to finish.
  - d. or a loaf of bread.
4. I would like the book after
  - a. you are finished with it.
  - b. you haven't finished reading it yet.
  - c. my little brother doesn't know how to read.
  - d. but my mother said I couldn't have it.
5. George is a very nice boy although
  - a. he often gets in trouble.
  - b. his brother is nice too.
  - c. yes, a very nice boy.
  - d. he never does anything bad.
6. John likes to watch movies although
  - a. he doesn't watch them very often.
  - b. yes, he does.
  - c. a new color television set.
  - d. westerns and spy movies.
7. It's as warm today as
  - a. it was yesterday.
  - b. the sun isn't even out yet.
  - c. my brother prefers it colder.
  - d. the snow will soon be here.
8. He gave me the job as
  - a. we had agreed.
  - b. Saturday or Sunday.
  - c. two dollars an hour.
  - d. I didn't take it.

9. Cathy fell off her bicycle; as a matter of fact  
a. I was there when it happened.  
b. she wasn't hurt.  
c. yes, she fell off her bicycle.  
d. she doesn't even own a bicycle.
10. Jane was invited to the party; as a matter of fact  
a. so was her sister.  
b. she decided not to go.  
c. Susie wasn't invited.  
d. she wasn't.
11. He looked at the tree as if  
a. he expected to see a ghost.  
b. he always looks at trees.  
c. he looked at the tree.  
d. his brother doesn't like trees.
12. Because of the rain I felt as though  
a. I were catching a cold.  
b. because the sun came out.  
c. no, my sister doesn't like the rain either.  
d. a great many dark clouds.
13. This summer I'm going to get a part-time job; at any rate  
a. that's what I hope to do.  
b. my brother doesn't like to work.  
c. I don't know where it will be.  
d. I doubt it.
14. That little boy is afraid of dogs; at any rate  
a. he always runs when he sees one.  
b. so am I.  
c. my uncle has a German shepherd.  
d. some dogs are big and some are small.
15. Japan is a very pretty country; at least  
a. that's what I've heard.  
b. the United States.  
c. my brother went to France.  
d. I'm going there for a visit.
16. Jack is going to get a bicycle for his birthday; at least  
a. that's what he says.  
b. he tells a great many lies.  
c. he doesn't know how to ride.  
d. his mother doesn't like bicycles.



17. Jenny is always doing something wrong; at the same time  
a. everybody seems to like her.  
b. like breaking the dishes.  
c. except for her many bad habits.  
d. so am I.
18. Mary loves her little dog and cat; at the same time  
a. she always forgets to feed them.  
b. she likes her dog better.  
c. my brother has a pet frog.  
d. they get along very well together.
19. I didn't feel well because  
a. I ate too much candy.  
b. the cookies tasted so good.  
c. I had to stay in bed.  
d. my brother didn't feel well either.
20. We liked the movie because  
a. the little girl was so pretty.  
b. nobody likes movies.  
c. yes, it was very interesting.  
d. those on television are better.
21. Try to finish your homework before  
a. you go out to play.  
b. my sister doesn't know how to read.  
c. the television doesn't work.  
d. I guess you don't have to.
22. Don't eat the cookies before  
a. you eat dinner.  
b. your mother said so  
c. they're not good for your teeth.  
d. I don't think you should.
23. The doctor isn't going to hurt you; besides  
a. you shouldn't be such a baby.  
b. maybe he will.  
c. your little sister is afraid of doctors.  
d. the pills taste terrible.
24. I don't like that game; besides  
a. I'm too old to play a silly game like that.  
b. the street or any other place.  
c. I'll play if you really want me to.  
d. the television is broken so we might as well play.

25. I guess he's going to visit his uncle; certainly  
a. that's what he said.  
b. his aunt and his two cousins.  
c. he won't go after all.  
d. I guess he is.
26. He'll be here if he said he would be; certainly  
a. he wouldn't tell you a lie.  
b. he's always watching television.  
c. he won't be here after all.  
d. we have many reasons for not trusting him.
27. They think you're very rich; consequently  
a. they always want to borrow money.  
b. you've worked very hard for your money.  
c. money isn't everything.  
d. ten dollars is a lot of money to some people.
28. A shark was seen in the water; consequently  
a. no one was allowed to go swimming.  
b. it was probably your imagination.  
c. they are not considered dangerous.  
d. sharks are seldom seen around here.
29. My uncle has a very good job considering that  
a. he dropped out of school.  
b. my father has a much better job.  
c. his son has a good job too.  
d. he never saves any money.
30. My brother does very well in arithmetic considering that  
a. he never does his homework.  
b. he does better in spelling.  
c. he never watches television.  
d. although I'm not positive.
31. He always plays with fire despite  
a. his mother's warning.  
b. he's never gotten hurt.  
c. the matches.  
d. he thinks it's fun.
32. The ship sailed straight ahead despite  
a. the heavy wind.  
b. it was very powerful.  
c. for very long.  
d. that's where the captain wanted to go.

33. You have to take either  
a. the red one or the green one.  
b. as many as you want.  
c. none at all.  
d. a dozen of them.
34. My mother said I could have either  
a. a new coat or a new hat.  
b. a dollar to go to the movies.  
c. a big cake for my birthday.  
d. nothing at all because I was bad.
35. He loves his father even though  
a. his father is very strict.  
b. he loves his mother more.  
c. his father loves him too.  
d. he always says so.
36. George doesn't do well in school even though  
a. he tries very hard.  
b. his brother doesn't like school.  
c. no, he does very well.  
d. he never does his homework.
37. My older brother just started college; eventually  
a. he's going to study law.  
b. he's finding it very difficult.  
c. or that's what he says.  
d. my sister isn't very interested in education.
38. We've had poor weather for almost two weeks; eventually  
a. it has to get better.  
b. with one storm after another.  
c. the sun never seems to shine.  
d. or at least in any event.
39. Albert does very good work except that  
a. he always gets mixed up.  
b. John does better work.  
c. he does good work every time.  
d. his older brother.
40. It seemed as if it would be a lot of fun except that  
a. I was afraid we'd get in trouble.  
b. but I don't know.  
c. it really was.  
d. my mother and father.

41. Most flags have three colors; for example  
a. the American flag is red, white, and blue.  
b. some flags have only two colors.  
c. I think you're mistaken.  
d. every flag has three colors.
42. Most fruit grows on trees; for example  
a. we have apple trees, peach trees, and pear trees.  
b. strawberries don't grow on trees.  
c. I like trees better than bushes.  
d. that's something I learned many years ago.
43. Sometimes school is boring; for the most part  
a. it's very interesting.  
b. my brother doesn't like to read.  
c. yes, it's very boring.  
d. he dropped out when he was sixteen.
44. Yesterday my father was very angry; for the most part  
a. he's very easy-going.  
b. my mother bought a new dress.  
c. my mother was angry the day before.  
d. he has to work very hard.
45. The little boy ran across the street; fortunately  
a. there were no cars coming.  
b. his mother told him not to.  
c. his dog was hurt by a car.  
d. most little children do the same thing.
46. The heavy rain caused the river to flood; fortunately  
a. no one was hurt.  
b. it happens every year.  
c. many houses were washed away.  
d. it looks as if it's going to rain even harder.
47. The picnic was spoiled by the bad weather; furthermore  
a. there were ants all over the food.  
b. we had a good time.  
c. we went out to the movies.  
d. picnics are a lot of fun.
48. The car was old and used a lot of gas; furthermore  
a. the brakes weren't very good.  
b. we liked it anyway.  
c. that isn't unusual for old cars.  
d. it was almost brand new.



49. My little sister is always getting into trouble; however  
a. we always forgive her.  
b. she always spills her milk.  
c. she makes me very angry.  
d. I don't think I'll play with her.
50. Our team seems to lose every game; however  
a. we have a lot of fun.  
b. almost every team seems to beat us.  
c. I don't like to lose.  
d. my brother likes to read rather than play baseball.
51. We're going to the mountains for our vacation; if possible  
a. we're going to stay two weeks.  
b. yes, we're definitely going.  
c. we don't like to swim.  
d. we may not go after all.
52. Our car does not run very well; if possible  
a. we're going to buy a new one.  
b. we don't like the color.  
c. most cars are much bigger.  
d. as well as trouble with the brakes.
53. Monkeys are fun to watch; in a way  
a. they're almost like people.  
b. I guess not.  
c. at the zoo.  
d. but I doubt it.
54. Her hair is a very unusual color; in a way  
a. it's very pretty.  
b. but I don't like it.  
c. with a pretty yellow ribbon.  
d. as well as brown.
55. Paul is very smart; in addition  
a. he has a nice personality.  
b. his brother isn't very smart.  
c. he sometimes gets the wrong answers.  
d. yes, he's very smart.
56. Next Saturday we're going to the park; in addition  
a. we're going to the movies that night.  
b. my sister doesn't want to go.  
c. I hope it's a nice day.  
d. on Sunday too.

57. Meet me at the playground; in all probability  
a. I'll be there at three o'clock.  
b. meet me there.  
c. unless you're busy.  
d. nextdoor to the movie theater.
58. Vicki is going to have a party; in all probability  
a. you'll be invited.  
b. I don't like parties.  
c. that's what she told me.  
d. I doubt it.
59. Carl almost got hit by a car; in any event  
a. that's what I heard.  
b. so did his brother.  
c. and then he rode away.  
d. no, I guess I'm mistaken.
60. Dave should be made captain of the team; in any event  
a. he's the best player.  
b. he doesn't even like to play.  
c. I should be.  
d. maybe he won't.
61. Karen's mother is pretty; in fact  
a. she used to be a model.  
b. she has a terrible personality.  
c. although she's not as pretty as my mother.  
d. I'm not really sure.
62. Blue is my favorite color; in fact  
a. everything I own is blue.  
b. but green is even better.  
c. my brother doesn't like it.  
d. I doubt it.
63. Last summer I read a great many books; in general  
a. I prefer non-fiction.  
b. as well as swimming each afternoon.  
c. although not every day.  
d. except for spelling and arithmetic.
64. Forest fires cause a great deal of harm; in general  
a. the danger is worst during the summer.  
b. except for too much water.  
c. as well as other accidents.  
d. but not every year.

65. I am going to school in order that  
a. I become well educated.  
b. reading is very important.  
c. there's a storm.  
d. my mother told me to.
66. He raised a white flag in order that  
a. the soldiers know he was surrendering.  
b. he didn't have any other flag.  
c. the troops came charging on horseback.  
d. they shot at him anyway.
67. He rode his bicycle across the highway in spite of  
a. the warning from his mother.  
b. his brother said it was all right.  
c. he had to get to the other side.  
d. walking across at a safer place.
68. He refused to take the pills in spite of  
a. getting them from his doctor.  
b. his brother acts the same way.  
c. as well as the school nurse.  
d. his father said not to take them.
69. The weather report said it would be sunny; instead  
a. there was a bad storm.  
b. I saw it on television.  
c. I knew the report was wrong.  
d. there was sunshine all day.
70. We planned to watch television; instead  
a. we went to the movies.  
b. we often plan on things which don't happen.  
c. that's just what we did.  
d. my father watched it with us.
71. Tonight we're going to visit my uncle; in the meantime  
a. I think I'll study.  
b. he's not feeling well.  
c. so is my brother.  
d. because it's a nice day.
72. Next year we're going on a three-week vacation; in the meantime  
a. we'll have to save our money.  
b. my aunt may go with us.  
c. when it's warm and sunny.  
d. yes, we'll have a good time.

73. My grandmother is a happy person; in this respect  
a. we're a great deal alike.  
b. we're going to visit her.  
c. she gets angry at my little brother.  
d. she never speaks unless it's necessary.
74. My dog would rather eat candy than meat; in this respect  
a. he's as bad as I am.  
b. so would I.  
c. I'm not too sure.  
d. I don't allow him to do it.
75. You can eat now or later just as  
a. you wish.  
b. eating a good meal.  
c. well as the milk.  
d. no candy until after dinner.
76. I let him borrow my bicycle just so  
a. he could try it.  
b. he never gave it back.  
c. my brother said not to.  
d. whatever I told him.
77. She ran from the yard lest  
a. the dog attack her.  
b. that's what I thought.  
c. fast than her sister.  
d. it wasn't necessary.
78. I walked through the dark house lest  
a. everyone think I was afraid.  
b. than go around the back.  
c. that's what I told them.  
d. than my friends did.
79. The party doesn't begin until seven o'clock; meanwhile  
a. I have to finish my homework.  
b. I'll do my homework tomorrow.  
c. I'm not really looking forward to it.  
d. it's almost seven o'clock right now.
80. Next week I'm getting a new pair of shoes; meanwhile  
a. I'll wear my old ones.  
b. at least that's what my mother said.  
c. as well as a new coat.  
d. they're going to be light brown.



81. Everything he said was a lie; moreover  
a. I've never trusted him.  
b. I may be mistaken.  
c. sometimes he's very nice.  
d. as well as the first time.
82. Going to school is very important; moreover  
a. we should try to get more students to go to college.  
b. having a nice personality is also very important.  
c. I'd rather be on vacation.  
d. not everyone is able to go.
83. In spelling I'm neither  
a. the best student nor the worst student.  
b. better than anyone else in the class.  
c. as good as my sister.  
d. going to be very good.
84. Becoming a rich man is neither  
a. my dream nor my hope.  
b. than having no money at all.  
c. however, my uncle is looking forward to it.  
d. although I may be wrong.
85. My mother told me to stay at home; nevertheless  
a. I went to the party.  
b. I did what I was told.  
c. she changed her mind a little later.  
d. I thought she was being unfair.
86. My father was not able to finish high school; nonetheless  
a. he has a good job.  
b. I probably won't either.  
c. he has always been sorry.  
d. neither did my mother.
87. My brother is a very good student notwithstanding  
a. his poor test scores in arithmetic.  
b. but with studying very hard.  
c. my sister is too.  
d. he's going on to college.
88. My grandfather is still very rich notwithstanding  
a. his recent losses in the stock market.  
b. but with hard work.  
c. so are his two sons.  
d. money isn't everything.

89. My brother wants to be a doctor; of course  
a. he still has a long way to go.  
b. and he has to study.  
c. as well as working very hard.  
d. he as well as my father.
90. Jack has a hard time with spelling; of course  
a. I'm nearly as bad.  
b. with arithmetic and reading.  
c. as well as trying very hard.  
d. both of his sisters and his older brother.
91. You think I'm being foolish; on the contrary  
a. I know exactly what I'm doing.  
b. so do I.  
c. or any other way.  
d. my mother does also.
92. Mary says arithmetic is very difficult; on the contrary  
a. I find it very easy.  
b. I certainly agree with her.  
c. she never gets good grades.  
d. she always found it difficult.
93. Ken is the new class president; on the whole  
a. I think he'll do a good job.  
b. John was elected treasurer.  
c. I didn't vote for him.  
d. Ed ran against him.
94. My mother says I waste too much time; on the whole  
a. I guess she's right.  
b. she says it all the time.  
c. watching movies and quiz shows.  
d. as well as every night.
95. Your grades in history are poor; otherwise  
a. you are doing quite well.  
b. you had better study harder.  
c. mine are just as bad.  
d. compared to your brother.
96. If you save your money, you can buy a car; otherwise  
a. you'll have to walk.  
b. I'd prefer a green one.  
c. cars can be dangerous.  
d. yes, you'll have to save your money.

97. The children were playing with matches; presumably  
a. they're the ones who started the fire.  
b. as well as behaving very poorly.  
c. no, I didn't see them myself.  
d. unless you don't believe me.
98. Everyone seems to like the book; presumably  
a. I'll enjoy it too.  
b. as well as liking to read.  
c. except for watching television.  
d. or while on vacation.
99. You can buy a new sweater provided that  
a. you earn some money.  
b. your aunt or your older sister.  
c. credit as well as cash.  
d. your new shoes.
100. You may go to the party provided that  
a. you come home before ten o'clock.  
b. your friend's birthday.  
c. I don't really enjoy parties.  
d. your brother and sister.
101. I've been sick since  
a. I last saw you.  
b. a sore throat.  
c. I don't know why.  
d. I have to go to the doctor.
102. My brother has been in college since  
a. he graduated from high school.  
b. for a long time.  
c. as well as studying very hard.  
d. perhaps I'm mistaken.
103. Your grades are poor; somehow  
a. you'll just have to do better.  
b. going to school.  
c. you may not go to the movies.  
d. your health is also very important.
104. Bob wants to drop out of school; somehow  
a. we have to show him he's wrong.  
b. I saw him only yesterday.  
c. at least that's what he told me.  
d. yes, he wants to drop out.

105. I've read a series of books so that  
a. I can give a good report.  
b. my teacher told me to.  
c. reading is very important.  
d. my spelling is as bad as ever.
106. My mother gave me a dollar so that  
a. I could go to the movies.  
b. I asked her for it.  
c. she needed something from the store.  
d. I had to earn it by cleaning my room.
107. He sounds very honest; still  
a. I'm not sure I believe him.  
b. as honest as the next person.  
c. there's no reason to doubt his word.  
d. he certainly does.
108. Walking is very good exercise; still  
a. I prefer to ride.  
b. I walk a great deal.  
c. that's what my father always says.  
d. or maybe that isn't really true.
109. I can run faster than  
a. my brother can run.  
b. I had to stop for breath.  
c. but I always use my bike.  
d. early in the morning.
110. My father is taller than  
a. I am.  
b. my brother is next tallest.  
c. we have some small people in the family too.  
d. although not as tall as my uncle.
111. My cousin sprained his ankle; therefore  
a. he had to go to the doctor.  
b. while playing basketball.  
c. it isn't a very bad sprain.  
d. no one even seemed to notice it.
112. George caught a very bad cold; therefore  
a. he isn't going to the party.  
b. because it was wet and rainy.  
c. he doesn't even care.  
d. I saw him only yesterday.



113. The king waved the flag; thereupon  
a. the soldiers marched forward.  
b. the top of the hill.  
c. the flag was very important.  
d. the soldiers didn't see it.
114. The president raised his hand; thereupon  
a. the crowd gave a loud cheer.  
b. the flag-draped stage.  
c. no one saw him.  
d. it was a sign he had won the election.
115. I want to go to the movies though  
a. I know I shouldn't.  
b. I'm going.  
c. and a new western.  
d. the side entrance.
116. The soldier had courage though  
a. he said he was afraid.  
b. he won a medal for bravery.  
c. the entire war.  
d. he showed it.
117. He knows exactly what he's doing; thus  
a. there's no need to give him advice.  
b. perhaps he isn't sure.  
c. at least that's what he thinks.  
d. but on the contrary.
118. I want to buy a new coat; thus  
a. I'll have to save my money.  
b. yes, I really need one.  
c. my brother already bought one.  
d. my mother says I don't need one.
119. I saw him with my own eyes; undoubtedly  
a. he's the one who did it.  
b. although I'm not really sure.  
c. but I don't think so.  
d. unless he already admitted it.
120. He's always been very honest; undoubtedly  
a. we can trust him.  
b. as well as his brother.  
c. yes, very honest and a nice personality.  
d. although I'm not really sure.

121. I'd like to buy a ticket; unfortunately  
a. I don't have any money.  
b. the movie is a very good one.  
c. I'm going to buy one.  
d. yes, it was very unfortunate.
122. The painting is very pretty; unfortunately  
a. we don't have a good place to hang it.  
b. as well as a very nice frame.  
c. it had just the perfect blend of colors.  
d. as well as a nice color.
123. I'm going to the party unless  
a. my mother says I can't.  
b. or even afterwards.  
c. my brother and little sister.  
d. they drag me.
124. Tomatoes are not very good unless  
a. they are ripe.  
b. I don't like them.  
c. as well as red and juicy.  
d. they aren't good.
125. He said he'd be here at three o'clock; unquestionably  
a. he'll keep his word.  
b. let me see your watch.  
c. or perhaps I'm mistaken.  
d. he said four o'clock.
126. Next year I'm going to study history; unquestionably  
a. I'll learn a great deal.  
b. or maybe geography.  
c. as well as questions about arithmetic.  
d. high school and then college.
127. I will not give you the book until  
a. you pay me the dollar you owe me.  
b. my mother told me not to.  
c. it isn't a very good book anyway.  
d. the book I gave you.
128. I was doing very well with my homework until  
a. my friend called.  
b. I must finish it.  
c. but not any longer.  
d. my teacher doesn't think so.

129. For my birthday I'm going to get whatever  
a. I want.  
b. a bicycle.  
c. unless I behave myself.  
d. my mother said so.
130. He is such a good speaker he's going to win whatever  
a. prize they offer.  
b. kind of speech.  
c. at least that's what he thinks.  
d. or something very similar.
131. He goes to the store whenever  
a. his sister asks him to.  
b. because he's a good boy.  
c. and so does his brother.  
d. or later after school.
132. We always have a good time whenever  
a. we visit my uncle.  
b. because it's so much fun.  
c. or at the movies.  
d. and so do our parents.
133. There is a large spot on the rug where  
a. my brother spilled the coffee.  
b. because he's a bad boy.  
c. and there's another one over there.  
d. yes, I'm sure that's where it is.
134. On our vacation we stood where  
a. Lincoln made a famous speech.  
b. and my mother told us not to move.  
c. but then it started to rain.  
d. because that place looked best.
135. He sounds very honest whereas  
a. I know he's not.  
b. we all believed him.  
c. that's all he would say.  
d. tomorrow he'll say the same thing.
136. My sister thought the music beautiful whereas  
a. I thought it terrible.  
b. it had such clear tones.  
c. she always says the same thing.  
d. I did too.

137. We'll move the table to wherever  
a. you'd like us to put it.  
b. except next to the window.  
c. unless you object.  
d. as well as the chairs and rug.
138. We're going to hold the meeting wherever  
a. we can find enough space.  
b. to discuss what Tom said.  
c. because it's very important.  
d. and that's all there is to it.
139. After his speech we all wanted to know whether or not  
a. he'd be elected.  
b. so his speech wasn't very good.  
c. as well as a good reason.  
d. yes, it was a very good speech.
140. Before the game the captain asked him whether or not  
a. his leg was still sore.  
b. but he wanted to win.  
c. so there was no reason to worry.  
d. and every player on the team.
141. He gave us the book which  
a. was lying on the table.  
b. we would have preferred a different one.  
c. my brother said so.  
d. the red and green cover.
142. Sometimes I'm not sure which  
a. I like best.  
b. the blue one is very pretty.  
c. my cousin wanted it.  
d. there are so many to choose from.
143. At the party you can take whichever  
a. kind of cake you want.  
b. as well as candy and soda.  
c. but don't take too much.  
d. so we had a nice time.
144. My grandmother said I could choose whichever  
a. I liked best.  
b. but I couldn't make up my mind.  
c. yes, she's very good to me.  
d. although now I'm not sure.



145. You can watch television while
- a. I'm fixing dinner.
  - b. but not all night.
  - c. or go out to play.
  - d. you have to make up your own mind.
146. He had to work very hard while
- a. he was going to school.
  - b. but not all the time.
  - c. yes, he certainly did.
  - d. or get poor grades.
147. Please don't leave the house without
- a. my permission.
  - b. or any other way.
  - c. you must stay at home.
  - d. your father told you not to.
148. I can't do my arithmetic without
- a. knowing how to multiply.
  - b. even my little brother can do it.
  - c. the book never has the right answer.
  - d. or any other kind of homework.
149. He always tells lies; yet
- a. people always believe him.
  - b. that's why he gets into trouble.
  - c. he certainly does.
  - d. one lie right after the other.
150. I think she's very nice; yet
- a. most people don't like her.
  - b. there's something I like about her.
  - c. no, you must be mistaken.
  - d. as well as pretty and a nice personality.

## APPENDIX B

### Teacher's Evaluation of Language Skill

Name of pupil . . . . . Date of  
(last name first) . . . . . Rating . . . . .  
(month) (year)

Teacher . . . . .

## TO TEACHERS

Your help on the following points will be greatly appreciated. In rating each item, disregard your ratings for that pupil on every other item; try not to let general impressions color your judgments about specific aspects of the pupil's language. We would most certainly appreciate any comments, illustrations or noteworthy episodes that throw light on the ratings. If you can give us the time, write them in any empty space or on the last page.

Number 1 is LOW and is described by the words at the left-hand side of the scale.

The numbers 2, 3, and 4 represent degrees between HIGH (5) and LOW (1).

Number 5 is HIGH and is described by the words at the right-hand side of the scale.

PLEASE CHECK BY ENCIRCLING THE NUMBER APPROPRIATE IN EACH CASE.

EXAMPLE: You consider a pupil just slightly better than average on a certain skill. You circle the number four, as follows:

1 2 3 ④ 5

### 1. Skill in communication

LOW  
incompetent with all  
language; no awareness  
of listeners; speaks  
without trying to evoke  
understanding from others;  
halting pace of words and  
inflections of voice not  
adjusted to listeners;  
writes like an  
illiterate person

1 2 3 4 5

HIGH  
uses language in any form with power, proficiency, and pleasure; adjusts pace of words and inflection to listeners; uses an "imparting tone"; is aware of need to make self understood; writes competently with a sense of style

## 2. Organization, purpose, and point

### LOW

rambles, no sense of order or of getting to the point; rattles on without purpose; cannot tell a story or express ideas in a suitable sequence

### HIGH

1 2 3 4 5 plans what is said; gets to the point; has control of language; can tell a story or express ideas in a suitable sequence

## 3. Wealth of ideas

seldom expresses an idea; appears dull and unimaginative; doesn't originate suggestions or plans

1 2 3 4 5 expresses ideas on many different topics; makes suggestions on what to do and how to carry out class plans; shows imagination and creativity in many ways

## 4. Fluency

seldom talks; exceptionally quiet; needs to be prompted to talk; overly laconic

1 2 3 4 5 talks freely, fluently, and easily; also talks brilliantly and effectively

## 5. Vocabulary

uses a meager vocabulary, far below that of most pupils this age; inarticulate, mute

1 2 3 4 5 uses a rich variety of words; has an exceptionally large, effective, and growing vocabulary; speaks fluently with vocabulary suited to listeners

## 6. Quality of listening

inattentive, easily distracted; seldom attends to the spoken language of others; doesn't listen for relationships or note how main ideas control illustrations or subordinate ideas

1 2 3 4 5 superior attentiveness and understanding of spoken language; a creative listener

7. Quality of writing

LOW

lacks coherent organization; often does not follow conventional usage and spelling; a very poor writer

1 2 3 4 5

HIGH

organizes in terms of a purpose; excludes irrelevant materials; subordinates elements not to be stressed; uses appropriate style, acceptable usage, and conventional spelling; a superior writer

8. Reading

reads only what he has to read; "deciphers" print rather than reads it; gets no ideas from books; will not very likely read more than newspapers and magazines (if that) when schooling is over

1 2 3 4 5

reads voraciously, easily, and with interest books of merit and difficulty; absorbs ideas from books easily and accurately; will undoubtedly read much all throughout life

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1. Activity

listless, apathetic, passive; has very little to do with others; prefers to sit; has low energy level; has slow reactions; seems always tired

1 2 3 4 5

very active; relates easily and freely with others; has a high energy level; enjoys physical activity; has quick reactions; seems exceptionally vital and alive



## 2. Acceptance or rejection

### LOW

rejected by others,  
disliked; almost  
never chosen by  
others or included  
in activities;  
almost entirely  
isolated

1 2 3 4 5

### HIGH

notably popular with  
everyone; others seek  
his company; never lacks  
companionship; always  
included in peer-group  
activities

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### OTHER COMMENTS:

Your comments here on the language or general adjustment of this pupil are most helpful to the research. Any comments will be of great interest to us and deeply appreciated. (Use other side if necessary.)